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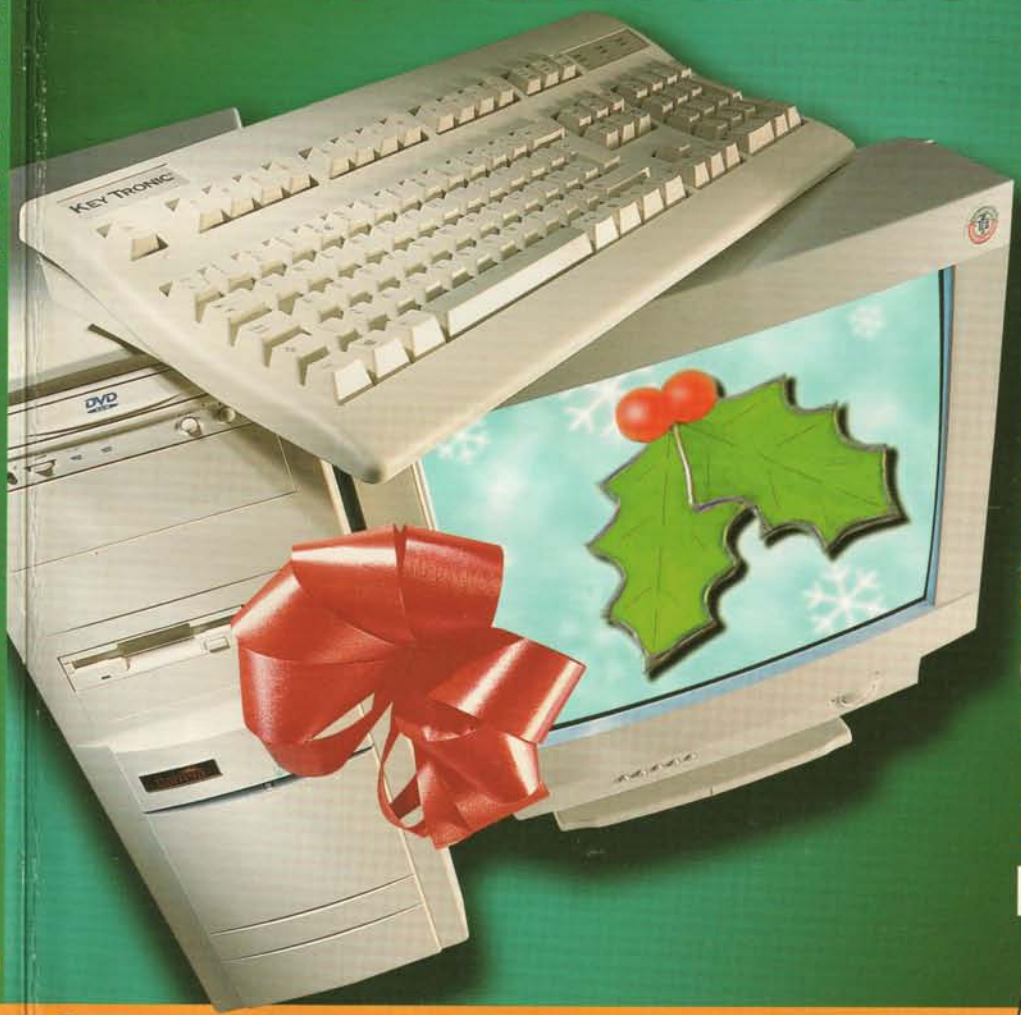

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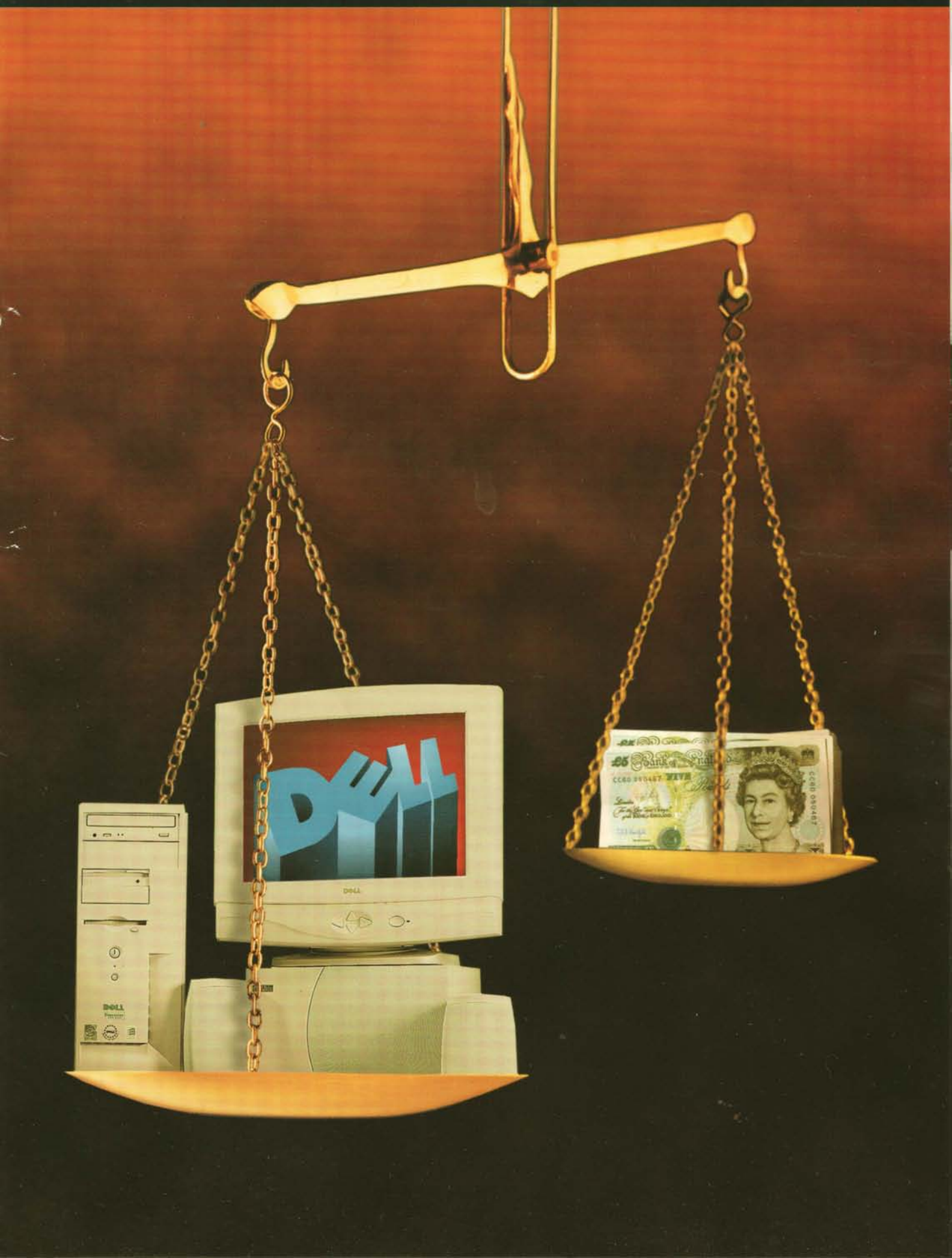

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1 Source: PC Magazine Service and Reliability Survey 1998, Servers and Portables. 2 Source: Personal Computer Magazine Readers Award 1998 Best Telephone Support. 3 Source: Overall Winner PC Pro Reliability & Support 1998: Notebooks. *Source: IDC

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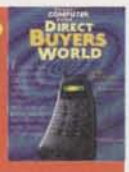

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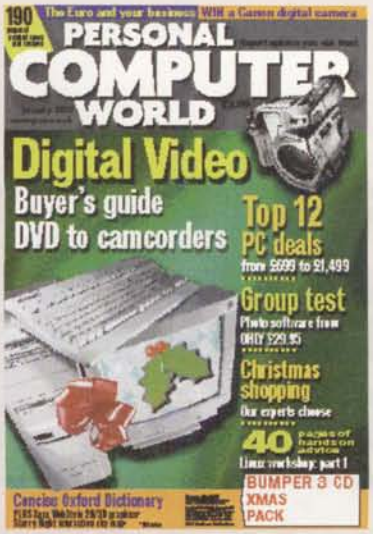

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In the world of PCs, the future's bright, the future's digital.

Definitely digital

Computers may have calmly dealt with zeros and ones for decades, but as far as the consumer electronics market is concerned, the late 90s have seen a digital feeding frenzy. Wherever you look there are digital cameras, digital camcorders, a host of digital audio formats, digital mobile phones, digital televisions, and who could forget digital versatile disc, DVD? It's undeniably an exciting time, not just for the promise of superior quality but also for the convergent possibilities. If your PC and digital camcorder talk the same digital language, then why not connect them directly to each other and be done with all those nasty analogue signals? In some cases, it really is almost as simple as that. Most digital camcorders are fitted with IEEE-1394 FireWire interfaces, and while not exactly widespread on PCs yet, you can buy suitable interface cards to exchange information. Early adopters of Digital Television may also find 1394 interfaces in the back of their set-top boxes, too.

The greatest interest today lies with digital video, whether captured with a camera, delivered on a disc or transmitted over the airwaves. We'll be taking a much closer look at Digital TV as soon as the cable companies get their act together in the New Year, but in the meantime this issue contains our complete guide to digital video [p208]. We've looked at digital camcorders, digital (and analogue) video capture, video-conferencing cameras, all-in-one TV tuner cards, and a selection of DVD-ROM drives, along with how to watch movies on your PC. It wouldn't, however, be *PCW* if we didn't have a PC group test, and this month we've got a system for everyone [p138]. In time for Christmas we've compared no less than 12 PCs: four budget models at £699, four mid-range systems at £999, and four high-end £1,499 PCs, ideal for power users or gamers alike. Equally irresistible is our group test of budget photo retouching packages under £100 [p184] – in fact, some are as cheap as £30! The harder-core of you will be pleased to find the first of a three-part *Hands On Workshop* on the increasingly popular Linux operating system [p242]. And anyone who deals with financial software will welcome our guide to the euro and its implications for your small business [p166].

If your PC and digital camcorder talk the same digital language, THEN WHY NOT CONNECT THEM DIRECTLY TO EACH OTHER?

Finally, it may say January on the cover, but you are without doubt reading our Christmas issue. Upholding a festive tradition, the *PCW* staff have written their Christmas wish lists to Santa [p128], which will be winging their way to the North Pole, or at least to the manufacturers who've produced the most desirable kit this year. And if the long winter nights are getting you down, then why not have a go at our 1998 *PCW* Christmas Quiz [p175] – no less than 50 festive (and, er, industry-based) questions await your perusal. The person with the most correct answers out of the sack when we get back to work will win a Canon digital camera, and the next 20 get a copy of Microsoft Encarta 1999. What more could you ask for? Merry Christmas and Happy New Year!

Gordon Laing, Editor

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January COVER DISC

GAMES | APPLICATIONS | LIBRARY | ENTERTAINMENT | INTERNET

If you are looking for the very latest version of Netscape, you're in the right place. Version 4.5 is out and it's hot, so if you'd rather not download 13Mb from the internet you can get your own copy here, first!

We couldn't let a Christmas issue go by without including something for the season, so we've got an interactive Christmas Advent Calendar and some Christmas lights, too, to add a festive touch to your desktop.

There's fully-playable game action in the game-of-the-movie, The Fifth Element, in addition to cheeky action from the Robosaurs, as well as exclusive music and video in our Entertainment section.

The Fifth Element

The Fifth Element recreates the atmosphere of Luc Besson's hit movie, with gameplay that is a balanced combination of skill, exploration and combat. Purchase the full version and you will have to make your way through 15 distinct 3D levels, using your agility to leap across precarious platforms, solve puzzles and kill the baddies.

The art team from the film have assisted in carrying over the film's sumptuous visual feel, and Luc Besson's original drawings and design sketches for the film were used to maintain the colour and atmosphere of the original. The detailed 3D graphics will run on standard PC video cards but there is also a direct 3D mode, and native support for Power VR and 3DFX based video cards.

The game also features 12 music themes. Eric Serra, composer of the original movie soundtrack (in addition to other films including The Big Blue, and Leon), wrote an additional track for the game. He also worked with the developer's musicians to recapture the musical atmosphere of the movie. Cinematic sequences, taken straight from the film, appear regularly, taking you into the Fifth Element universe with your favourite actors.

PCW DETAILS

Operating system
Windows 95/98
Limitations
Two-level demo.
Sales contact
Available from all good computer game outlets.
Technical support
0181 9449000 (9.30am-5.30pm)
www.ubisoft.co.uk

Technical information to help you use the CD

✔System Requirements

You will need a PC running Windows 3.1 or 95. The disc will run under NT but functionality may be reduced. Please check individual products for specific system requirements. For best results, run the CD on a Pentium PC with at least 16Mb of memory.

✔How to use the CD-ROM

Put the disc into your CD drive.
Windows 95 – The *PCW* interactive loader will appear on your screen. If your CD doesn't autoload, go to Start/Run and type <CD Drive>:\pcw.exe
Windows 3.1 – From Windows Program Manager choose File/Run, then type <CD Drive>:\pcw.exe and press enter.

✔Faulty Discs

If you get messages like "Cannot read from drive D:", or your drive continually scans the disc without starting, you may have a faulty disc. In this event, please return the disc with a covering note bearing your name and address, and clearly marked "PCW CD JANUARY 1999" to: **TIB plc, HelpLine Returns, Unit 5, Triangle Business Park, Pentrebach, Merthyr Tydfill, CF48 4YB.** A replacement disc will be sent to you by post. You must use this address as replacement discs cannot be supplied from the VNU offices.

✔Technical Support

If you have technical problems with individual products, check in the magazine or on the CD, for the manufacturer's support contact details. For general problems with the CD, the Technical Helpline is open weekdays (10:30am-12:30pm and 1.30pm-4:30pm) on 01685 354726. A live technical info page is also available through CD Online, direct from the CD (*see p19*). And see "Faulty Discs" (*above*) for replacement disc information.

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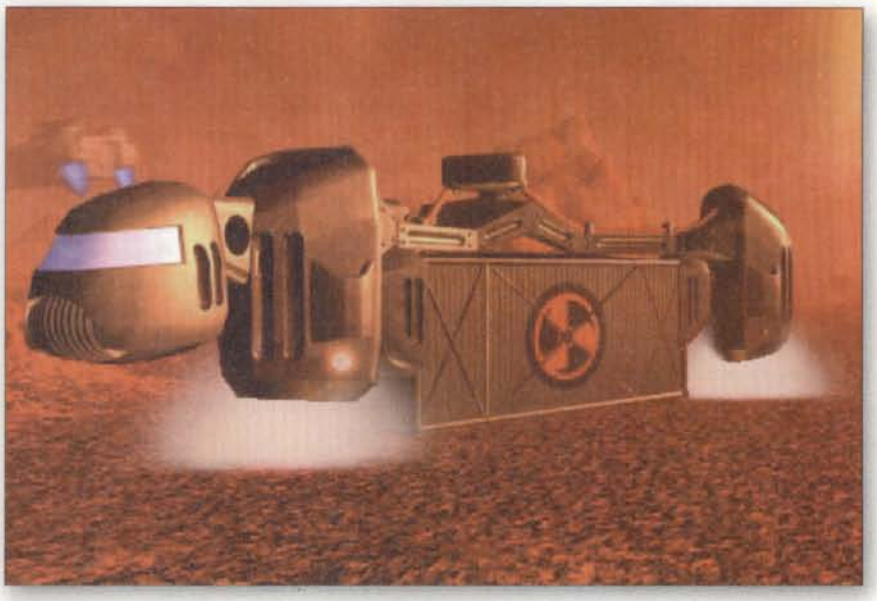
The publisher, VNU, has checked the Personal Computer World CD-ROM for known viruses at all stages of production but cannot accept liability for damage caused either to your data or to your computer system which may occur while using either the disc or any software contained on it. If you do not agree with these conditions you should not use the disc. It is good practice to run a virus checker on any new software before running it on your computer and to also make regular backup copies of all your important data. Unless otherwise stated, all software contained on the CD is for demonstration only. This means it may be restricted in some way. For example, it may be time limited or have certain functions disabled.

✔Getting software onto the CD

PCW is keen to promote quality software and would like to hear from you if you are interested in having your product included on a future cover disc. Phone Afshan Nasim on 0171 316 9592 or email afshan_nasim@vnu.co.uk.

Robosaurs versus the Space Bastards

• ***Warning** — Please do not install and play this game if easily offended. It's a fun game but we would recommend that parental guidance be applied.*



So what's it all about then? Well, a distant world and a powerful race of evil robots who are planning to enslave the known universe by landing on planets and shooting anyone who doesn't do what they're told. And then there are the four dedicated Robosaurs: Connery, Eastwood, Campbell and Van Damme. Hmmm... now you know where *this* game is coming from!

Your enemies are the Space Bastards, and to kill them all, you may "...move crates, blow things up, leap off tall stuff, and slaughter innocent endangered species of alien life". Robosaurs has its tongue firmly in its cheek and if you don't mind a few slightly rude Michael Caine sound-a-like samples, you'll love it.

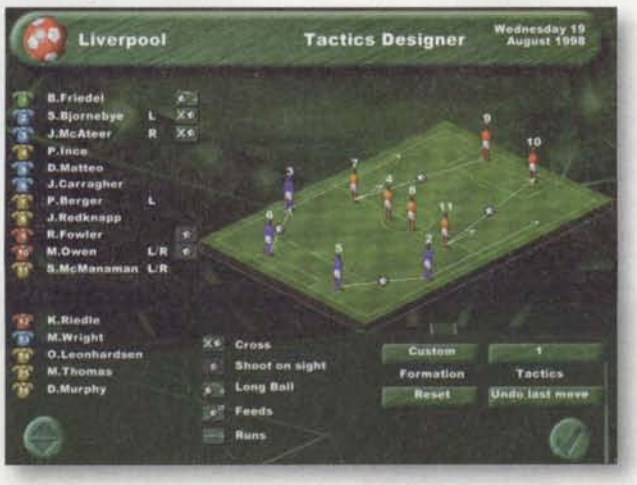
The full product features different planets, with each one having ten levels to complete. Once you have completed all the levels you will be immediately warped to a new planet.

The demo version, contained on the disc, allows you the choice of two Robosaurs, two planets, two sets of levels, and "training" mode.

PCW DETAILS

Operating system *Windows 95/NT 4.0*
Limitations *Limited characters and levels.*
Sales contact *01634 226200*
Technical support *Tech Support 01703 365071 (9.30am-5.30pm)*

Player Manager



Player Manager – Season 98-99 is a football management game which puts you in control of teams from the top five European leagues.

Money is plentiful: more than 80 percent of the top world-class players play in these five leagues and the financial rewards of success are enormous. But top clubs across Europe are bidding for these players in search of national and European trophies. So, as a manager, you are under severe pressure to satisfy shareholders' expectations. The financial consequences of failure will be dire both for the clubs and the managers.

The game requires you to understand your individual players' skills and limitations and their role within the team. Buying the very best players available doesn't guarantee success. To assist you, Player Manager provides a wealth of information and tools with which to assess your players, both on and off the pitch.

The full PC version includes more than 12,000 players, with 18 visible statistics such as passing, shooting, stamina and intelligence. There are 20 operational statistics such as fitness, fatigue, nervousness and hesitancy.

As the team's manager, it is up to you to decide what actions your goalkeepers, defenders, mid-fielders and forwards will take during the game.

PCW DETAILS

Operating system *Windows 95*
Limitations *Not all features are available or fully functional.*
Sales contact *01252 795302*
Technical support *support@anco.co.uk (9.30am–5.30pm)*

CD-ROM HELPLINE 01685 354726

Starry Night Basic

• *Before installing, please note this product requires Quicktime 3 to be installed. This is not available on the disc.*

The full product of Starry Night lets you "view" the night sky from any place on Earth or in the Solar System, at any time in the past or in the future. It is used around the world by parents, educators and amateur astronomers as well as those just beginning to discover the wonders of astronomy. At the Starry Night website (www.siennasoft.com), you can view a reconstruction (which was created using the package) of how the sky looked to passengers of the SS Titanic, five minutes before the ship foundered.

Great fun and educational, too, this is a totally fascinating piece of software. Using other features you can:

- Place yourself from your own backyard to anywhere on earth and experience an accurate recreation of the sky at that place.
- Time travel from 4713BC to 9999AD.
- View constellations.
- Use the magnifier to zoom in on planets, stars and moon, with amazing clarity of graphics.
- Connect to www.LiveSky.com, for more information about what you are viewing.
- Blast off from the earth or create star charts for your next trip.
- See what the night sky looked like on your birthday.

Starry Night Basic is limited to views from the Earth only and has been designed for those who have a developing interest in astronomy.

PCW DETAILS

Platform
Windows 95/NT 4.0
Limitations
Ten-day trial, with views from Earth only.
Sales contact
orders@siennasoft.com
Technical support
support@siennasoft.com

Christmas Magic

Because it's that time of year, and we'd like to get into the festive spirit, here's one for the children and others still young at heart: a demo of Christmas Magic, an interactive Advent Calendar from Jellyfish Software.

This demo of Christmas Magic gives you a different window for the first five days of December, which open onto lavish animations relating the history and customs of Christmas around the world. These have been written by a recognised expert and author on Christmas traditions and are supplemented with Christmas-orientated fun and games – the full version offers the whole month, of course. Children will enjoy the traditional excitement of seeing what each new day has in store.

PCW DETAILS

Operating system
Windows 95 and NT
Limitations
First five days only.
Sales contact
01625 539494
Technical support
0161 4773773 (9am-6pm) support@jelly-fish.com

Xara WebStyle

Xara WebStyle lets you create top-quality, custom-designed, web-optimised graphics: buttons, bullets, dividers, 2D and 3D headings and backgrounds of any colour, with any text. Its aim is to make the creation of professional web graphics quick and easy for all. Using vector graphics, high-quality on-screen appearance and design can be achieved. Graphics are generated by modifying the extensive, professionally designed, WebStyle template graphics. As these templates are vector files, they can be scaled, re-coloured and your own text applied, without loss of quality. Xara's technology means that rendering is fast and output is anti-aliased and dithered for the sharpest possible on-screen result. Xara WebStyle can be used for all web graphics. An unlock code for the trial version can be bought over the net for around £49. If you press the "Purchase" button that appears when the Xara WebStyle trial starts, you will be connected to a secure purchase site. A CD with a backup copy of WebStyle and the complete set of graphics templates is sent to all those who purchase an unlock code online. The normal retail (non-internet purchase) price is £60 (ex VAT).

PCW DETAILS

Platform
Windows 95/98 or NT 4
Limitations *15-day trial*
Sales contact
01442 350000
sale@xara.com
Technical support
technical@xara.com
www.xara.com/support

Hip Hop eJay

• *Please ensure that the CD-ROM is in the drive when using this software.*

The full version of Hip Hop eJay includes more than 1,300 original hip hop samples, all recorded by professionals for eJay's fully-fledged 8-track recording studio. By dragging and dropping selections of these samples onto eJay's innovative user interface, you can instantly hear how kickin' your mix is going to sound – and it really is surprising how good that can be! After you have laid down the basic tracks, you can add your own raps using the built-in recording studio, or scratch to your mix using eJay's unique turntable device. And, when it's complete and you are happy with the overall sound, you can record it for posterity. Take some time out though, this application is addictive!

PCW DETAILS

Platform
Windows 95/NT 4.0
Limitations
Limited samples and functionality.
Sales contact
01923 495496
Technical support
01923 495496 (9am-5.30pm)

Software Library

Unless otherwise stated, new versions of featured software are not upgrades but standalone installations. If you wish to install the latest version of a product, please ensure that you first uninstall/remove the older one.

OS/2 Warp Fix Pak #8 for Warp 4.0

This can be found in the directory <CD drive>:\handson\os 2\fixpack8. Please read the how2fix.txt file for important pre-installation data. More information can be found in the *Hands On OS/2* column (p272).

Essential Utilities

• **Adobe Acrobat Reader 3.01 + Search**
(*Win3.1/95/NT*)
This lets you view, navigate, and print PDF files across all major computing platforms. (Fully-functioning reader.)

• **DirectX 6**
(Windows 95)
Latest set of essential video and audio drivers that are required to run some of today's processor-hungry games and applications. (Fully-functioning drivers.)

• New
MacSEE
(*Win3.1/95/NT*)
MacSEE allows simple, fast, transfer of files between a Macintosh and a PC-compatible system by reading and writing directly to and from Macintosh disks on your PC. (Limited demo)

• **Netscape Communicator 4.5 (Standard)**
(*Windows 95*)
Latest version of the premier internet suite, including Netscape Navigator. (*Free version*)

• **Paint Shop Pro 5.0**
(*Windows 95*)
This is the latest version of this popular graphics editor, with powerful new features such as complete layer support, picture tube brushes, CMYK separations and pressure-sensitive tablet support. Also includes enhancements to Paint Shop Pro's flexible painting and retouching brushes, adjustable cropping and selection tools, and image enhancements. (*30-day evaluation*)

• **SoftCopier 3.4.2.2c**
(*Windows 95/NT*)
SoftCopier, used in conjunction with a scanner, is a simple-to-use yet powerful software photocopy solution. Containing more functions than most Photocopiers, SoftCopier will revolutionise the way you copy documents. (*Time limited demo*)

• **UBE 98 1.8**
(*Windows 98*)
UBE 98 is a security program which can encrypt your work in hand. It also has the ability to create encrypted self-extracting .exe files for distribution to others. The program uses 2,048-bit encryption technology. (*Shareware*)

• New
Winarj 95/98
This is a 3-bit Windows shell for ARJ Archive Software, written for Windows 95/98 and supports long filenames. (*Time limited demo*).

• New
WinZip 7.0
(*Windows 95/NT*)
Industry-standard compression/decompression utility for Windows 95 and NT with automatic built-in disk-spanning support for multi-disk Zip files. (*21-day evaluation version*).

New Software This Month

• **Business**
(*Windows 95 and NT*)
Business is a multi-user PC software package for small companies but will scale up to hundreds of users if required.
It integrates the sales, service, human resources and accounting functions with email, fax and telephone functions. Business is written in Microsoft Access (*Limited demo*)

• **Holiday Lights**
(*Windows 95/NT*)
Holiday Lights places rows of festive light bulbs around the edges of your screen. It plays cheery music and includes a screensaver. (*Shareware*)

• **K-Chess Elite**
(*Windows 3.1/95*)
An educational chess program which is simple-to-use, informative and plays a good game. K-Chess Elite is highly customisable and you can change dozens of the options which control the game's operation. (*Shareware*)

• **Shailoo**
(*Windows 95/98*)
Shailoo has massive four-way scrolling screens packed with monsters, deadly fungus, firestones and some brain-bending puzzles. (*Limited demo*)

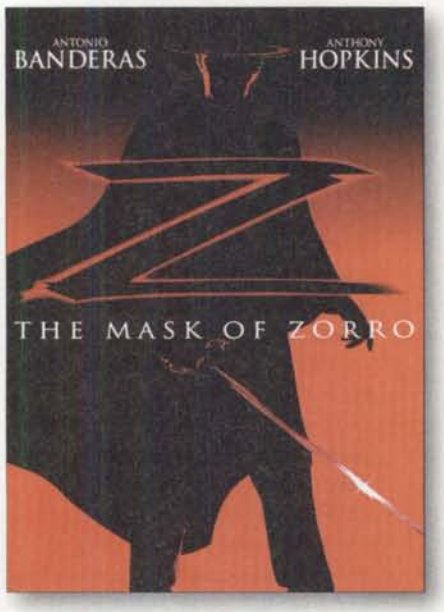
• **Tracking Santa**
(*Windows 3.1/95/NT*)
Santa's sleigh is not big enough to hold all the toys for his trip around the world so he periodically returns to the North Pole for re-supply. The elves used to have a problem with this: they didn't know where he was, or when he was coming. Their solution is this Tracking Santa program. Now they always know where Santa is, how many homes he has visited and when he is heading back for another load. (*Shareware*)

• **Wall Street Raider**
(*DOS*)
This corporate takeover game simulates a real-time stock market, with constantly moving ticker and financial news headlines as you attempt to react to the ever-changing economic model. One to four players, or play against computer. (*Shareware*)

PhotoDisc

PhotoDisc offers a unique internet photo-library service, and on this month's CD we offer a preview of their collection. In addition to the ten images on this disc, PhotoDisc offers access to 74,990 other stunning images direct from the web. From the PhotoDisc website at www.photodisc.com/uk, you can search, select, purchase and download the entire collection of 75,000 images. The images on offer are of the highest standard and this has lead to PhotoDisc becoming one of the world's leading sources for royalty-free innovative, diverse, and compelling images.
If you need an image quickly and easily, visit the site direct from our *PCW* CD by going to the CD Content Links section of CD OnLine *(see p19)* accessible from the front screen.

ICV Entertainment Section



This month's ICV Entertainment Section is packed full of video and music. There's an exclusive opportunity to see the film trailer for "The Mask Of Zorro" and videos from four of today's top artists.

The Mask of Zorro

Antonio Banderas dons a mask and swishes his way into history as the latest actor to play Zorro and you can see the trailer for this great new action adventure film right here. Twenty years after the original retired his black sash, the adversary who robbed Zorro of his fortune returns to terrorise the Mexican countryside. Banderas is the mysterious drifter who accepts his fate to renew the legend. Also starring are Anthony Hopkins and Catherine Zeta Jones in her first major Hollywood role.

Music Videos

Four great videos from current chart-topping bands. Audioweb can be seen and heard performing "Get Out Of Here". Ian Brown, legendary former member of the Stone Roses, is also here with his new single "My Star". Ian has just completed a UK tour with Audioweb playing support. Other hit videos come from Fastball and The Cardigans. What a line-up!

CompuServe trial

With one of the UK's leading online Internet Service Providers you can now enjoy *free* unlimited internet access for a month. The free online time is available during the first month only. Sign up today and discover how much more there is to the internet, with CompuServe.
(For general support, phone 0990 000 400).

Join CompuServe and claim a free software gift, worth £49.99

Simply load the CD-ROM found on the front cover of this issue of *Personal Computer World*.
You can enjoy one month's free membership including:-

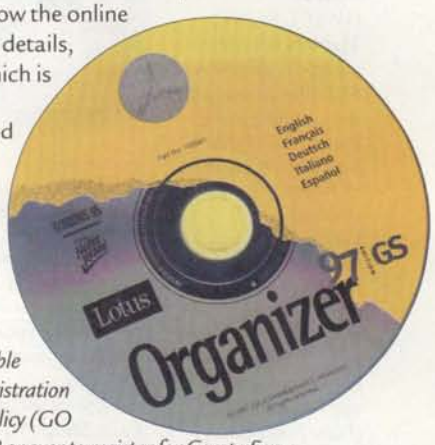
- FREE Unlimited access for 1month*
- FREE Online tour of CompuServe
- FREE Email address
- FREE 5Mb web space

CompuServe is the UK's most exciting Online Internet Service offering fast and easy access to the internet and its own exclusive online services. CompuServe organises the internet into easy-to-use categories so that you can find what you want at the touch of a button. Go shopping, book holidays and flights, find out about the latest films, keep up-to-date with news as it happens, or simply keep in touch with family and friends around the world with CompuServe email.

Free Gift

Once you have signed up to CompuServe you are entitled to claim as your free gift a **Lotus Organiser 97**, the world's most popular time management software. It integrates Calendar, To-Do List, Address Book, Call Manager, Planner, Anniversary Reminder and Notepad in one easy-to-use electronic book. How to claim your free gift — "Lotus Organizer 97" online.

Sign up to CompuServe using the CD-ROM on the front cover, simply click on the GO button at the top of the toolbar and type LOTUSORG. Follow the online instructions and fill in your details, including the offer code which is located on the back of the CompuServe CD wallet, and your member ID.
This offer applies to *Personal Computer World* readers resident in the UK or Northern Ireland. Offer ends 1st January 1999.



** The free online time is available during the first month after registration only, subject to our Fair Use Policy (GO UKFAIRUSE). You must be 18 or over to register for CompuServe membership. Premium Services (these are clearly marked) carry a surcharge and are excluded from the free online time. After your free trial, your membership will continue and payments will be charged automatically when they are due, unless you decide to cancel your membership.*

CompuServe.

VNUNET WWW.VNUNET.CO.UK

Vnunet.com offers speed of delivery, accuracy and breadth of coverage from five market-leading weekly newspapers: *Computing, Accountancy Age, PC Dealer, Network News* and *PC Week*, generating up to 50 stories every day of the working week. With correspondents in Europe, the US and Asia contributing daily to the VNU Newswire, a round-the-clock news service is available exclusively at vnunet.com.

More detailed information is available in a wealth of in-depth articles, covering news analysis and product reviews, from VNU's stable of monthly publications, including such titles as *Personal Computer World* and *Management Consultancy*, plus some of the best editorial material from VNU's portfolio of 15 business and consumer titles.

JOBWORLD WWW.JOBWORLD.CO.UK

Jobworld.co.uk is a free service which provides you with access to thousands of new IT, business and finance vacancies every day. All you have to do is browse the site by job sector or search on a specific set of job skills or requirements.

The Jobworld Email Alert service offers extra freedom by sending only details that match the job seeker's preferences, allowing the recipient to control exactly what information is sent and when.

Jobworld also offers links to job sites overseas, a guide to IT contracting and comprehensive lists of jobs from the top recruitment agencies in the UK.

PCW CD OnLine

Access the internet direct from the opening screen!

Want to find out more about any of the software products contained on this month's disc? Are you connected to the internet? Well, you can visit the software manufacturers' web sites via the Content Links of the CD-Online section. Simply click on the web link banner at the top of the main screen to run your browser and access *PCW* CD-OnLine direct from the disc. CD-OnLine gives you access to the *Personal Computer World* web site, Vnunet.com and to Jobworld.co.uk. And, if you are interested in any particular product or section on the CD, the Content Links Section gives you direct access to the latest information at the live company web sites.

You will also find live, up-to-date technical information about the CD and there's even a preview of what will be on next month's disc! And, if you've enjoyed the magazine and the CD, you will even be able to subscribe via email while you're online!

Virgin Net Offer

Virgin Net is the award-winning online service from the Virgin group. It's easy to use, help is available 24-hours a day and best of all your first month is free. We even throw in 10Mb of webspace and five email addresses so that you can really get the most out of the internet.

After your first month's free service, Virgin Net costs only £11.99 per month (incl. VAT) for unlimited access.

PCW DETAILS

Platform
Windows 3.1/95
Limitations
One month's free membership.
Sales contact
0500 558800
Technical support
0845 6500000

AOL Offer

Easy-to-use internet online service *free* this month with 50 hours' online time! AOL channels cover everything from the latest news and sports to travel and entertainment. Net access is easy; go direct to web pages from your AOL menu bar. AOL offers 33.6K access speeds and has Explorer 3.0 integrated as its main browser. Remember, 350,000 UK subscribers can't be wrong!

- 50 hours online
- One month's AOL membership
- Five email addresses per account
- Free technical support
- 10Mb of web space
- 100 percent local call access

PCW DETAILS

Platform
Windows 95 and 3.1
Limitations
One month's free membership
Sales contact
0800 3765432
Technical support
0800 2797444

ClaraNet Offer

ClaraNet offers a full range of packages to suit all budgets. All accounts include free 24-hour tech support, 100 percent UK local call access, no connection or startup fee and free technical help to set up your web pages. All accounts have free access to a dedicated online games server. All calls are at local rate, including the online registration process.

- Choice of connection packages from £3.99(ex VAT) per month
- Free; three hours online per month*
- Free; up to 25Mb webspace*
- Unlimited email addresses*

**Subject to package*

PCW DETAILS

Platform
Windows 3.1/95
Limitations
One month free membership.
Sales contact
0845 355 1000
Technical support
0845 3553000

CD-ROM HELPLINE 01685 354726

PROCESSING INFORMATION

[WHAT YOU HAVE]

[WHAT YOU WANT]

To stay competitive, your network has to process more quickly than ever before. Enter, our Cheetah® disc drive. It's the world's fastest. In fact, it's 40% faster than almost anything else out there. Which means your customers can transact at record-breaking speeds, while your network's poised to handle whatever's around the next curve. To find out more, visit us at www.seagate.com.

Seagate®

Information, the way you want it.™

PCW Cover Disc Questionnaire

Now that you've seen what's on this month's PCW CD, it's your turn to tell us what you'd like to see in the future. Please spend a few moments filling out this questionnaire, and remember — the more help you give us, the more we are able to deliver the product you want! If you don't want to cut this questionnaire out of the magazine, just photocopy it and send it to the FREEPOST address at the foot of this survey — no stamp required.

1. Please indicate how free software, cover-mounted on the front of our magazine, influences your purchase decision of PC magazines (the scale ranges from strongly DISAGREE ①, to strongly AGREE ⑤).

I am more interested in the content of the magazine than the free software	①	②	③	④	⑤
I would buy a magazine that I didn't necessarily want to buy if it had software that interested me	①	②	③	④	⑤
I look at all the free software before deciding which publication to buy	①	②	③	④	⑤
I always buy the same publications regardless of the free software	①	②	③	④	⑤
I choose the magazine with the highest-value software	①	②	③	④	⑤

2. ① What type of software are you *most* interested in? *(choose one only).*
② What *other* piece of software are you interested in? *(choose one only).*

Office (word processor, spreadsheets)	①	②	Schedule and contact management	①	②
Programming languages	①	②	PDA software	①	②
Operating systems	①	②	Strategy games	①	②
Accounting and finance	①	②	Simulator games	①	②
Desktop and web publishing	①	②	Arcade games	①	②
Photo and drawing	①	②	Home improvement (DIY, gardening)	①	②
Music, audio and MIDI	①	②	Reference (encyclopaedias, dictionaries, maps)	①	②
Maintenance and anti-virus utilities	①	②	Tutorials and training	①	②
Web and internet utilities	①	②	Children's stories	①	②

3. Which format of software do you prefer to receive *(please tick)*:

Full working versions of recent programs	☐	Free internet access trials	☐
Full working versions of older programs	☐	Drivers, updates and large downloads...	☐
"Time-bombed" trial versions	☐	...if "yes" to drivers or updates, please tell us which are the most useful _____	
Limited functionality demonstration software	☐		

4. Have you ever bought the full version of a software package after trialling the demo version from a magazine?
If so, please tell us which software _____

5.What other types of free gift or offer would motivate you to purchase the magazine on which they appear?

	Yes	No
Booklets or supplements	☐	☐
Price reduction of the magazine	☐	☐
Internet trial discs	☐	☐
Show tickets (Windows/Networks/Live 98 etc)	☐	☐
Mouse mats	☐	☐
Other	☐	☐

(please specify) _____

6. If you could name just one piece of software to go on the PCW CD, what would it be?
(please specify) _____

Once you have completed this questionnaire, please return it to: Katy Lefevre, PCW Software Questionnaire, Freepost 25, 32-34 Broadwick Street, London W1E 6EZ. REMEMBER — YOU DO NOT NEED A STAMP!

Which is the best computer value-for-money or one with

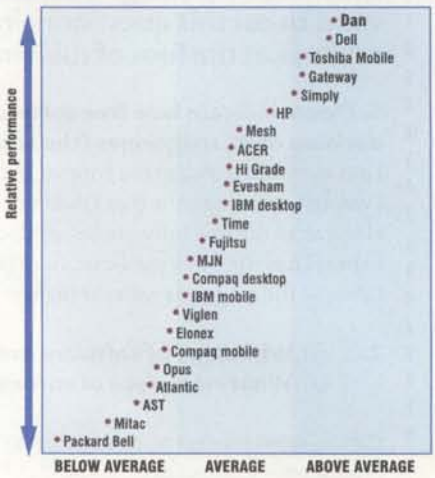
With Dan

Dan Technology has enjoyed enormous success in polls conducted by the nation's leading computer magazines. In recent years, we've consistently won top honours from the readers of PC Direct, PC Magazine, PCW, What PC? & PC Pro.

Our products, the Dan PCs featuring Intel® processors, after-sales service and overall reliability – all have always received more than enough votes to place Dan in the first rank of PC vendors. But this year we've done even better. Two of the leading magazines asked readers probably the most important question of all: would they buy from the same vendor again? We are proud and delighted to reproduce the answers here.

The August 1998 Service and Reliability Reader's Survey in PC Magazine revealed that Dan users were more likely to stick with their current PC vendor than owners of *any* other brand. Incidentally, this is the third year in a row that Dan has headed PC Magazine's brand loyalty league table. Personal Computer World's 1998 Service and Reliabilty Survey (October issue) revealed the same high level of customer confidence and satisfaction.

WILL DEFINITELY REPURCHASE THE SAME BRAND IN THE FUTURE



intel inside pentium® II

dantum 2 WS

Dual Pentium®II Processor capability

- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- 128MB PC100 SDRAM (1x128MB)
- Choice of Hard Disk Drive
- Iomega 100MB ZIP Drive + 1 cartridge
- Matrox 8MB MillenniumG200 Video Card
- 19" SVGA L/R N/I Monitor (Viewable size 18" - 450mm)
- 56KBPS VoiceFax/Modem (UK only)
- 32MAX Speed EIDE CD-ROM
- Dual Port SCSI Controller (Ultra & Wide)
- Midi Tower Case with PSU
- Microsoft IntelliMouse™
- Windows UK Keyboard
- **Software:** Windows NT Workstation & MS Works 95

with single processor	PENTIUM II 350	PENTIUM II 400	PENTIUM II 450
8.0GB UMA EIDE	£ 1469	£ 1598	£ 1747
4.1GB UMA EIDE	£ 1585	£ 1714	£ 1863
9.0GB WIDE SCSI	£ 1745	£ 1874	£ 2023
For dual Pentium®II processor systems:			
Please add	£ 171	£ 300	£ 449

Above prices exclude VAT@17.5%.

dantum 2 Duo Server

Dual Pentium®II Processor capability

- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- 128MB PC100 ECC SDRAM (1x128MB)
- Choice of Wide SCSI HDD
- ATi 2MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32" - 333mm)
- 32MAX Speed SCSI CD-ROM
- Intel® Express Pro 100 UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- Full Size Tower Case with PSU
- Microsoft IntelliMouse™
- Windows UK Keyboard
- **Software:** Windows NT Server (5 user licence)

with single processor	PENTIUM II 350	PENTIUM II 400	PENTIUM II 450
4.1GB UMA EIDE	£ 1841	£ 1970	£ 2119
9.0GB WIDE SCSI	£ 2001	£ 2130	£ 2279
For dual Pentium®II processor systems:			
Please add	£ 171	£ 300	£ 449

Above prices exclude VAT@17.5%.

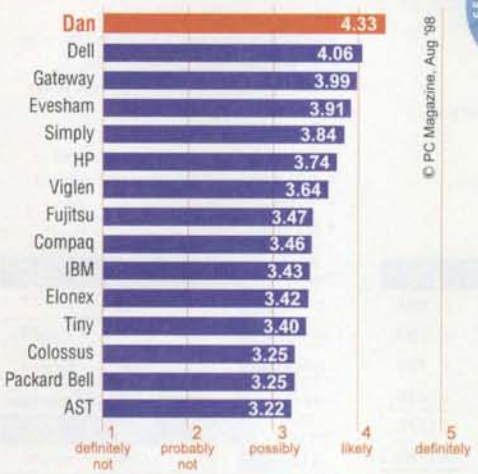
go direct to dan

vendor? One which gives the happiest customers?

you get both.

custom build and price your own system on-line
dan on the web
www.dan.co.uk

LIKELIHOOD OF REPURCHASING FROM THE SAME VENDOR



The performance difference between two makes of PC is often measured in mere fractions of a second. These polls clearly indicate that service, support and overall reliability are now just as important to computer users as speed, if not more so.

Ask yourself, are you really satisfied with your PC supplier when it comes to these matters? If not, give us a call and we'll show you why our users keep voting us Number One. If the answer is yes, you're probably a Dan owner already.

YEAR 2000 COMPLIANT
All Dan PCs are year 2000 compliant

1997/98 Annual Awards
from Computer Magazine Reader Surveys and Editorial Teams

Sevice & Reliability Award
PC Magazine, 1993-8 Surveys

Most Reliable PC Manufacturer
PCW 1998 Awards

Best PC Manufacturer
Best Hardware After Sales Service
What PC? 1998 Readers Awards

Best Network Servers Award
PC Direct Hits 1994-8 Surveys

Best Educational Systems
PC Direct Hits 1998 Survey

Best Service Award
PC Pro, 1997 Survey

Best On-Site Maintenance
PCW 1997 Survey

Best Customer Service Award
PC Plus 1997 Survey

In addition, Dan has also received numerous monthly editorial Awards.

Includes 1 Year On-site Warranty

dan Ultimate 2

with Pentium®II Processor

- Intel® Pentium®II Processor with 512KB Cache Memory
- 64MB PC100 SDRAM (1x64MB)
- Fast 8.0GB Hard Disk Drive
- Iomega 100MB Zip Drive + cartridge
- ATi 8MB Xpert'98 AGP Video Card
- 17" Iiyama L/R N/I Monitor (A701GT) (Viewable size 16.2" - 405mm)
- 32MAX Speed EIDE CD-ROM
- SoundBlaster AWE 64 OEM
- Hi Fi Power Speakers (150W PMPO)
- 56KBPS VoiceFax/Modem (UK only)
- MS IntelliMouse™, Windows UK Keyboard
- Midi Tower Case with PSU
- 1 Year On-site Maintenance
- **Software:** Windows 98 or 95 (specify) MS Works 95, Serif Page Plus, Intuit Quicken 6SE & Encarta US

PENTIUM II 350	£ 1232	£ 1448 incl. VAT
PENTIUM II 400	£ 1357	£ 1595 incl. VAT
PENTIUM II 450	£ 1500	£ 1763 incl. VAT

dantum 2 /MS

with Celeron® or Pentium®II Processor

- Choice of Intel® Celeron or Pentium®II Processor with Cache
- 32MB SDRAM (1x32MB)
- Fast 3.2GB UDMA Hard Disk Drive
- ATi 4MB 3D Charger AGP Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32" - 333mm)
- 32MAX Speed EIDE CD-ROM
- Sound Blaster 16 Soundcard
- Hi Fi Power Speakers (150W PMPO)
- 56KBPS VoiceFax/Modem (UK only)
- Microsoft IntelliMouse™
- Windows UK Keyboard
- Desktop Case with PSU
- **Software:** Windows 98 or 95 (specify) MS Works 95, Serif Page Plus, Intuit Quicken 6SE & Encarta US

CELERON 333	£ 753	£ 885 incl. VAT
PENTIUM II 350	£ 794	£ 933 incl. VAT
PENTIUM II 400	£ 919	£1080 incl. VAT

All systems also include: Fast EIDE PCi HDD Controller, 1 Parallel, 2 Fast Serial and 2 USB Ports, 1.44MB Floppy Disk Drive, MMX™ Brand Software (Ultimate 2 & dantum 2/MS only).

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AMD® K6-2 Processor Based System

- 32MB SDRAM
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- Choice of AMD K6-2 Processor
- 512KB Pipeline Burst Cache Memory
- ATi 2MB 3D Charger Video Card
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- 32MAX Speed EIDE CD-ROM
- Fast EIDE PCI HDD Controller
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- 1 Parallel & 2 Fast Serial Ports
- Windows UK Keyboard
- Windows 98 or 95 (please specify)
- Microsoft IntelliMouse™
- MS Works Suite

Call for 380/400 CPUs

AMD Processor	AMD K6-2 300	AMD K6-2 350
3.2GB	£ 544	£ 588
4.0GB	£ 553	£ 597
5.0GB	£ 569	£ 613
6.4GB	£ 576	£ 620
4.1GB SCSI	£ 880	£ 924
9.0GB SCSI	£ 1040	£1084

8.0GB HDD upgrade from 6.4GB	**£ 17**
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- Choice of Hard Disk Drive
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATi 4MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"–333mm)
- 32MAX Speed EIDE CD-ROM
- Fast EIDE PCI HDD Controller
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows 98 or 95 (please specify)
- MS Works Suite

Intel Processor	CELERON 300A	CELERON 333	PENTIUM® 350
3.2GB	£ 624	£ 641	£ 684
4.0GB	£ 633	£ 650	£ 693
5.0GB	£ 649	£ 666	£ 709
6.4GB	£ 656	£ 673	£ 716
4.1GB SCSI	£ 960	£ 977	£1020
9.0GB SCSI	£1120	£1137	£1180

400MHz Pentium II upgrade from 350	**£ 129**
450MHz Pentium II upgrade from 350	**£ 278**

dantum 2 WS

Dual Pentium® II Processor capability

- 128MB PC100 SDRAM (1x128MB)
- Choice of Hard Disk Drive
- Intel® Pentium®II Processor (single or dual) with 512KB Cache Memory
- Iomega 100MB ZIP Drive + cartridge
- Matrox 8MB Millennium G200 Video Card
- 19" Super VGA L/R N/I Monitor (Viewable size 18"–450mm)
- 56KBPS VoiceFax/Modem (UK only)
- 32MAX Speed EIDE CD-ROM
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- MS IntelliMouse™, Windows UK Keyboard
- Windows NT Workstation
- MS Works Suite

Single Processor	PENTIUM® 350	PENTIUM® 400	PENTIUM® 450
8.0GB UDMA EIDE	£1469	£1598	£1747
4.1GB WIDE SCSI	£1585	£1714	£1863
9.0GB WIDE SCSI	£1745	£1874	£2023

As above with 2 CPUs installed as standard

Dual Processor	PENTIUM® 350	PENTIUM® 400	PENTIUM® 450
8.0GB UDMA EIDE	£1640	£1898	£2196
4.1GB WIDE SCSI	£1756	£2014	£2312
9.0GB WIDE SCSI	£1916	£2174	£2472

Windows NT 4 Workstation upgrade... £ 72

Call for low cost upgrade to Office 97 & Office 97 Pro

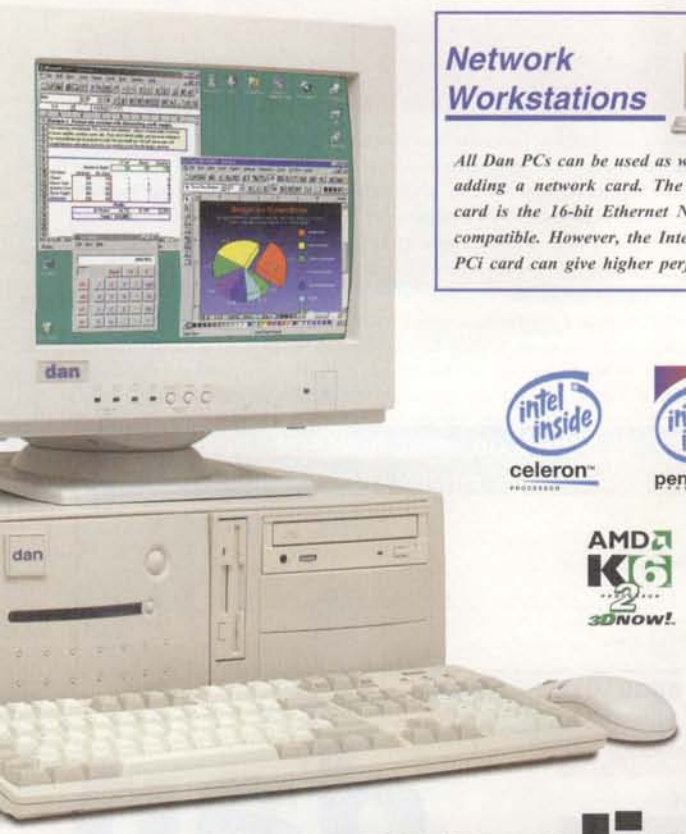
Delivery cost to mainland UK for one system is £19.

Network Workstations

All Dan PCs can be used as workstations by adding a network card. The most popular card is the 16-bit Ethernet Novell NE2000 compatible. However, the Intel Express Pro PCi card can give higher performance.

Example of Workstations:

Entry level Station dantum /W		Best Seller Station dantum 2 /W		Power User Station dantum 2 WS /W	
dantum/K6-2/300	*£ 544*	*dantum 2/300A*	*£ 624*	*dantum 2 WS/350MHz*	*£ 1469*
16-bit Ethernet card	*£ 16*	*Intel Express Pro card*	*£ 39*	*Intel Express Pro card*	*£ 39*
Workstation price	*£ 560*	Workstation price	*£ 663*	Workstation price	*£ 1508*



intel inside celeron™ processor

intel inside pentium® II processor

AMD K6-2 3DNow!

6 Years Winner

Annual PC Magazine Service & Reliability Reader Survey

"For the sixth year in a row Dan wins the Overall Satisfaction for Desktop PCs category, making it the most successful vendor in this survey ever. Its achievement is enhanced this year by its taking the overall winner's crown, as well as an equally strong showing in every one of the survey's categories... Quite apart from top marks for consistency, Dan is clearly doing something right. It's not a huge international organisation, but its service, reliability and support are clearly world class... Dan is the company that makes us feel good."
PC Magazine, August 1998, Service & Reliability 1998 Reader Survey

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dantum 2 Server

Pentium® II Processor Based System

- 64MB PC100 SDRAM (1x64MB)
- Choice of Ultra DMA HDD from table
- Intel® Pentium®II Processor with 512KB Cache Memory
- ATi 2MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"–333mm)
- 32MAX Speed EIDE CD-ROM
- Intel Express Pro UTP Network Card
- Fast EIDE PCi HDD or Adaptec PCi SCSI Controller
- 1.44MB Floppy Disk Drive
- Full Size Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows 98 or 95 (or NT at extra cost)
- MS Works Suite

Pentium®II Processor	PENTIUM® II 350	PENTIUM® II 400	PENTIUM® II 450
4.0GB	£ 789	£ 918	£1067
6.4GB	£ 812	£ 941	£1090
4.1GB WIDE SCSI	£1077	£1206	£1355
9.0GB WIDE SCSI	£1237	£1366	£1515

18GB Wide SCSI HDD from 9GB Wide **£ 387**

dantum 2 Duo Server

DUAL Pentium® II Processor capability

- 128MB PC100 ECC SDRAM (1x128MB)
- Choice of Wide SCSI HDD
- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- ATi 2MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"–333mm)
- 32MAX Speed SCSI CD-ROM
- Intel Express Pro UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- Full Size Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows NT Server (5 user licence)

Single Processor	PENTIUM® II 350	PENTIUM® II 400	PENTIUM® II 450
4.1GB WIDE SCSI	£1841	£1970	£2119
9.0GB WIDE SCSI	£2001	£2130	£2279

As above with 2 CPUs installed as standard

Dual Processor	PENTIUM® II 350	PENTIUM® II 400	PENTIUM® II 450
4.1GB WIDE SCSI	£2012	£2270	£2568
9.0GB WIDE SCSI	£2172	£2430	£2728

18GB Wide SCSI HDD from 9GB Wide **£ 387**

dantum 2 RAID Server

DUAL Pentium® II Processor capability

- 128MB PC100 ECC SDRAM (1x128MB)
- 18GB SCSI HDD (3x9GB HDDs in RAID 5 config. with HotSwap capability + spare/redundant 9GB HDD worth £412)
- Choice of single or dual Intel® Pentium®II Processor with 512KB Cache Memory
- ATi 2MB 3D Charger Video Card
- 14" Super VGA L/R N/I Monitor (Viewable size 13.32"–333mm)
- 32MAX Speed SCSI CD-ROM
- Adaptec RAID PCI controller
- Intel Express Pro UTP Network Card
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- RAID Server Case with redundant PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Windows UK Keyboard
- Microsoft IntelliMouse™
- Windows NT Server (5 user licence)

Single Processor	PENTIUM® II 350	PENTIUM® II 400	PENTIUM® II 450
18GB WIDE SCSI	£3977	£4106	£4255

As above with 2 CPUs installed as standard

Dual Processor	PENTIUM® II 350	PENTIUM® II 400	PENTIUM® II 450
18GB WIDE SCSI	£4148	£4406	£4704

Call for information on LVD SCSI Drives

For Novell Netware File Servers: you must upgrade the EIDE CD-ROM to SCSI add £ 30 (plus £ 95 for Adaptec AHA 2920 SCSI controller if needed)

Network upgrades for dantum systems

Network Cards

16-Bit Network Card Ethernet (NE2000 comp. -Thin Ethernet/Twisted Pair)	£ 16
16-Bit Network Card Ethernet (3COM509)	£ 55
32-bit PCi Ethernet Card (3COM900)	£ 52
32-bit PCi 100Mbps base-T Ethernet Card (3COM905)	£ 43
32-bit PCI Intel Express Pro 100UTP Card	£ 39
Intel Express Pro 100UTP Server Card	£ 356

Network Hubs

8 Port 10 base-T Mini Ethernet Hub	£ 30
16 Port 10 base-T Mini Ethernet Hub	£ 102
Intel stackable 10/100 base 12 Port Hub	£ 796
Intel stackable 10/100 base 24 Port Hub	£1266

Uninterruptible Power Supplies - UPS

1000VA UPS Interactive (APC)	£ 319
700VA UPS Interactive (APC)	£ 230

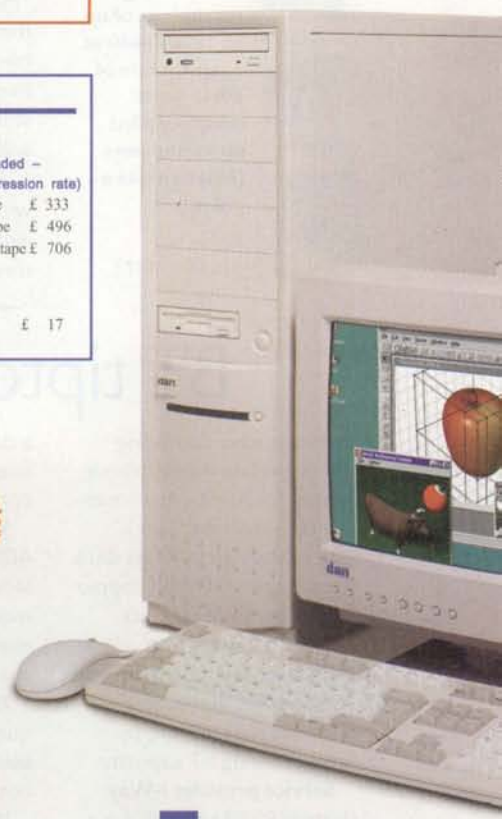
Tape Streamers for Servers

(Controller & Backup Software not included – figures in brackets denote max. compression rate)

2GB (4GB comp) DAT Streamer +90m tape	£ 333
4GB (8GB comp) DAT Streamer +120m tape	£ 496
12GB (24GB comp) DAT Streamer +125m tape	£ 706

Miscellaneous

15" Colour Monitor from 14" SVGA	£ 17



5 Years Winner & Runner-up

Network Server Category, Readers Survey – Direct Hits 1994,'95,'96,'97 &'98

"Yet again we saw the number of Network Servers available through the direct channel rise sharply in '97, with more companies than ever offering servers off the page. Runner-up Dell is just one of the direct manufacturers to seek a portion of this growing market. But the winner is a company that has continued to dominate when it comes to selling servers off the page, winning the Direct Hits Server award year after year, and that's Dan Technology." [Dan has won the Network Server category every year since 1993.]

PC Direct, June 1998, Direct Hits Readers Awards 1998

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dan technology

Comdex Special

The year's major IT event began in Las Vegas as we went to press, but you can read a Comdex special report on our web site at **www.pcw.co.uk**
And, of course, there'll be full coverage in next month's *PCW News*.

FALLING FLAT The market is literally going flat for CRT monitor makers as desktop LCD displays become more affordable. Sony, Mitsubishi, Panasonic and Samsung have all offered CRT displays with flat screens which are said to cut out damaging glare from reflections. Iiyama, too, has launched a £449 (ex VAT) 19in model called the Visionmaster Pro 450, offering resolutions of up to 1800x1440 at a refresh rate of 80Hz – the company piled up its monitors (*left*) to make a point.
Iiyama 01438 314417

OPERATING SYSTEMS

Enter Windows 2000 as Gates fights trustbusters

Microsoft will start the new millennium with a single operating system called Windows 2000, although it will have workstation and server versions.

The decision amounts to no more than a renaming of NT 5.0. But it spells the end of the Win9x line, and defines a minimum PC spec of 64Mb of RAM and a 300MHz PII processor.

Microsoft announced the changes as it sought to limit damage from the continuing DoJ anti-trust case. Accusations include: that Microsoft put pressure on Apple to drop its QuickTime multimedia player; and that it asked service provider AOL "How much do you want from us to screw Netscape?" Microsoft's response has been confused, though it is still not clear whether the DoJ will prove its case.

The case has coincided with a series of "leaks" from within Microsoft about the threat from rival developers. First there was a memo depicting Psion and its Epoc 32 operating system (now owned by Symbian) as a potential problem. Then, two so-called Halloween memos named Linux as a threat.

Epoc 32 (*see p29*) and Linux do offer credible alternatives in some markets. Linux got more backing this month, with Corel offering free downloads of a Linux version of WordPerfect (at linux.corel.com).

Cynics pointed out, however, that the memos portray Microsoft as less than a monopoly at the very time it faces charges of monopoly abuse. Still, a feeling persists that Microsoft rivals are gaining ground.

Even at last month's NT Show, which was bigger and better than ever, there were dissenting voices. IBM, which has been hedging bets on Unix and Linux, was boasting of its skills using NT in "a mixed environment" and doubting NT's scalability. Eddie Bleasdale, of NetProjects, was telling all who would listen: "Linux is a megatrend. It is not going to go away." Nor, when all's said and done, is Microsoft.

CLIVE AKASS (AND VNU NEWSWIRE)

• *New NT architecture — p40*

IE 5 beta

An early beta of the new Explorer 5.0 is available at www.microsoft.com. New features include better searching and management of favourites.

ADSL

BT tiptoes into broadband for homes

There were confusing signs last month about pricing for ADSL (Asymmetric Digital Subscriber Line), which piggybacks a fast data stream onto BT's old copper lines. Four pilot rollouts, offering an always-on 2Mbit/sec link upstream and 256Kbit/sec down, are underway in London, by firms reselling BT capacity.

Service provider I-Way charges £350 a month for a minimum six months.

Virgin Net has only about a dozen experimental ADSL lines working, for which it currently charges nothing.

VideoNet, which offers an ADSL video-on-demand service, is charging just £5 a month plus up to £3.50 per movie. Eventually it expects to charge £249 for a hookup.

BT Interactive would not quote prices. A spokesperson said the variation in prices is not surprising at this stage.

What is certain is that ADSL is here to stay – and it will get cheaper. BT's Simon Brooks, marketing manager of the service, said: "We are investing millions in it. We are serious about deployment."

He insisted that demand will persist for BT Highway, which offers a maximum 64Kbit/sec per ISDN channel. He agreed that ADSL rollout and pricing will be affected by what cable companies do. "If they start rolling out cable modems, fine. The...competition will move the takeup of high-speed service forward and bring down prices."

A new world standard for a slower DSL Lite was agreed last month, but even though BT is on the standards body, it has no immediate plans to use it.

ADSL pricing is a thorny problem. There is nothing to stop people using ADSL for IP voice calls at no extra monthly cost. Said Brooks: "...we are going to have to come up with a viable pricing model."

www.isntrial.bt.com

DIGITAL TV

PC users get a look-in at last

The first add-on cards to allow PCs to receive digital TV have hit the market. They are currently limited to free channels because conditional access cards allowing paid-for viewing are not yet available.

Easat Antennas is selling a £249 (inc VAT) kit, called Kiss SkyVision, which includes a PCI-based Digital Video Broadcasting (DVB) card and a separate MPEG decoder ISA card. The software will automatically search and configure itself for channels available on your dish aerial. The kit will also provide access to DirecPC turbo internet services, providing a down channel of up to 400Kbit/sec.

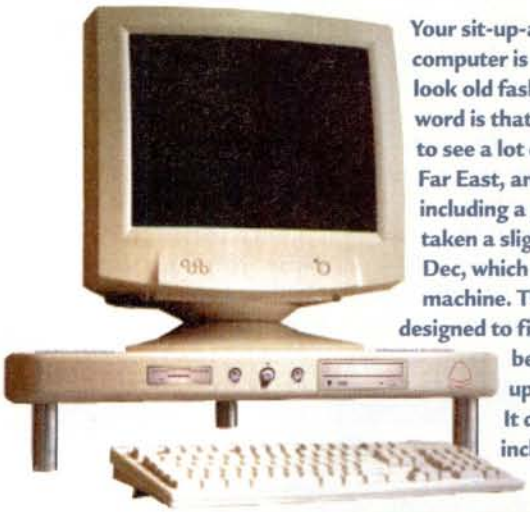
The kit also supports DVD and will be bundled with a DVD player for £389 (inc VAT).

MediaStar is offering its GlobalSat Vision DVB card with on-board hardware MPEG decoder for about £159. A Plus version, which should be on sale by the time you read this, includes a Common Interface Module allowing conditional access when available. This will also have output for standard or widescreen TVs.

Next year, the company plans a Gold Version with DVD support. Both the Plus and the Gold versions are also expected to cost around £160.

MediaStar 0181 814 2288; Easat 01782 208090 www.easat.co.uk

PC designs with a heart



Your sit-up-and-beg computer is starting to look old fashioned. The word is that we are going to see a lot of experimental designs coming out of the Far East, and Intel has been showing off a few novel PCs, including a pyramid. Cambridge IQ (01223 870817) has taken a slightly different approach with what it calls the Dec, which is a way of sprucing up the standard desktop machine. The heart-shaped platform (below and left) is designed to fit snugly in the corner, and the keyboard can be stashed underneath. It will take monitors up to 28in and the system box sits on the floor. It costs from £45 — options include a CD drive and an LS-120 superfloppy.

short stories

SYQUEST IN TROUBLE
Removable storage pioneer Syquest ceased trading shortly after announcing new versions of its 1Gb SparQ removable drive. There was speculation as we went to press that it might be bought by rival Iomega, although it could survive after a period of Chapter 11 protection.
• *New USB products, p36*
• *Superfloppy war, p42*

QUARTERDECK SOLD
Symantec has bought rival utility developer Quarterdeck in a deal worth $65m. The main reason for the move is to get around a legal dispute involving Symantec's Norton Uninstaller program. QuarterDeck offers a similar utility called CleanSweep.

TREAT IN STORE
Western Digital says its new, thin 18.3Gb SCSI drive will allow more storage to be packed into system boxes. The drive on the right (*above*) is its new 13Gb EIDE drive.
www.westerndigital.com

Geofox goes bust

Cambridge palmtop maker Geofox ceased trading on 2nd November after a failed bid to raise further funding. It launched its Geofox One palmtop last year using the same Epoc 32 operating system as Psion's Series 5.

The device was well received, but some felt Geofox would have done better to use Epoc 32 on a larger mobile rather than taking on the Series 5 in an increasingly competitive market.

A Geofox statement said that despite increasing sales, it could neither raise more funds nor find a buyer. "The directors have therefore had no choice but to place the company into receivership."

Geofox's sales and support line has ceased working, but a recorded message said there was the possibility that a third-party would take over support.

• *Boost for Psion OS — p29*
• *New mobiles — p31*

New AutoRoute goes streets ahead

The new AutoRoute Express, due out in February, will show all the streets in Britain. The £60 package (less a £10 cashback on registration) will not route street-to-street, but the new detail is sure to attract new classes of user.

Among them will be **Excel** and **Access** users who will be able to peg data to street maps, product manager Robert MacIntosh said.

● Microsoft is offering Christmas buyers £20 off its latest Encarta products (*Point of View* p28, and *review* p311).

● And, Microsoft was rumoured to be considering a bid for De La Rue, which prints banknotes for around 150 countries.

"I thought he was already minting money"

Processor prices fall for Christmas

Christmas price cuts have narrowed the gap between Intel's PII chips and low-end Celerons. The 350MHz PII price falls most: by 30 percent to $213. Prices of the 333MHz, 400MHz and 450MHz fall, to $181, $375 and $562 respectively.

The Celeron 333MHz 128Kb cache version falls 17 percent, to $159; the 300 MHz only 7 percent, to $138.

MIKE MAGEE

▲ CHIP WARS AT THE SUPERMARKET

PROCESSORS

Intel lines up for chip wars

Intel, facing its toughest opposition since it scooped the contract to power the first IBM PC, has outlined its processor roadmap. Barely one in two PCs sold in US shops in August had Intel chips, a 30 percent fall in one year.

Its response is to refine its policy of tailoring chips for different markets. It gave more details of its plans for the launch of the 64-bit IA64 range in mid-2000. This will retain a 32-bit core for backward compatibility, and the 32-bit dynasty will survive well into the millennium.

The Celeron will remain Intel's main offering in the entry-level market, where PCs are being sold like soap in supermarkets. Tesco (*pictured*) is offering a £699 Seimens PC based on a 300MHz Celeron. But PCs using chips from the likes of AMD, Cyrix and IDT (*see box, above*) can be £200 or more cheaper. Christmas price cuts (*left*) may put the PII into this market. The high-end Xeon PII will lead the way into the future. The timetable is:

1999 Launch of PII, codenamed Tanner, with Katmai-enhanced graphics.

2000 Tanner's 0.18 micron successor, Cascades, will boast on-chip L2 cache. Later, IA64 will début with Merced. Intel is playing this down, saying performance will be on a par with Cascades.

2001 The 32-bit Foster, with a new core, will clock 1GHz. Later, McKinley will lift IA64 performance beyond Merced and the 32-bit line.

Beyond 2001 The 64-bit dynasty will split into 0.13-micron high and low-end versions, codenamed Maddison and Deerfield respectively.

CLIVE AKASS

Rivals gear up

AMD is challenging Intel at the power PC level. Its Sharptooth K6 is pitched against the Katmai PII. In 1999, its K7 will aim higher, using the same 200MHz EV6 bus (maybe the same motherboard) as Digital's Alpha.

Cyrix says its M3 chip will have a new core called Jalapeno, with streamlined memory access and hard-wired 3D. It will launch at 600MHz in late 1999. Also due then is a Socket 7 500MHz WinChip 4 from IDT with a new architecture. **IDT** says yet another design will launch a year later. New Intel neighbour, **Rise**, has joined the cloner ranks with a low-end x86 design.

Brains of Britain

POINT OF VIEW

One of the brighter suggestions for Britain's millennium project was to digitise the entire contents of the British Library. The Dome won, but there are moves to shift more of the national knowledgebase online – and big US companies are getting involved.

Intel (which, as it happens, has set up a "virtual Dome" site at www.dome2000.co.uk) is giving £1.5m for a digital gallery at the Science Museum's new Wellcome Wing. The idea is to create exquisite visualisations of scientific themes, viewable online. These will be brought up to date, at no small cost, as new discoveries are made.

Also likely to get involved is Microsoft. Its chief technology officer, Nathan Myhrvold, sits on the board of trustees.

Microsoft's new Encarta reference suite is an excellent example of what can be done. London publisher Webster (which has no connection with the famous US dictionary) has no less than 60 people working full-time on the British version. Some of the work involves keeping the web links up to date and honing them to provide the best sources. As more resources come online, works like Encarta will look increasingly like a front-end to our collective memory banks.

Britain and the net both have a tradition of free access to knowledge, but commercial content is bound to increase. Bill Gates knows this well. His Corbis company has been buying digital rights to artworks and millions of photographs.

UK taxpayers, while unlikely to object to subsidising online resources for UK use, might balk at making access free to the world. Digital content could provide vital revenue for museums, galleries, and media archives. Intel's Sean Maloney clearly had this sensitive aspect in mind when he said of the £1.5m gift: "This is not a plot to steal the intellectual property of the Science Museum."

Indeed, British suspicions of sponsorship and commercialisation can go too far. The more money these resources get, the better they will be.

• *Encarta review – page 311*

▲ ENCARTA — FRONTS GLOBAL MEMORY BANKS

Clive Akass ***on accessing our national knowledgebase***

MEMORY

Out of sight... the new atomic RAM

Researchers in Denmark claim to have made a breakthrough in using a single hydrogen atom to store one bit of data, pointing the way to hypercompact IT devices.

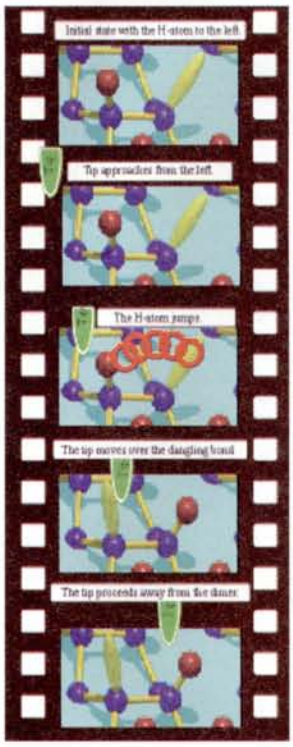
IBM performed a similar trick using Xenon atoms at a temperature near absolute zero. But researchers at the Technical University of Denmark's microelectronics centre have proved it can be done at room temperature with material in common use: silicon, in the form of a lattice of atom pairs called dimers, coated with hydrogen to prevent oxidation.

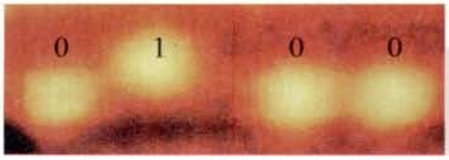
Each silicon atom at the lattice surface forms a strong bond with a hydrogen atom. The Danes used a scanning tunnelling microscope (STM) to knock out one hydrogen atom from a dimer, leaving a bond flailing with nothing to cling to (*top right*).

An STM uses an electrode with a sharp tip and exploits quantum effects, allowing individual atoms to be imaged and manipulated. By applying a voltage to the tip and moving it close, the remaining hydrogen atom can be switched from one silicon atom of the pair, to the other (*lower right*). "The voltage is large, so the switch is stable," said Kurt Stokbro, who developed computer simulations of the effect.

Devices using the idea are some years off. One is likely to be a storage medium which is scanned by an STM, much as today's disks are scanned. Even further off are solid state devices using a matrix of STM-style tips. "There is a lot of research going on in this area," said Stokbro.

www.mic.dtu.dk/mic





◀ HOW THE DATA APPEARS ON AN STM SCAN

Small comfort for Symbian

The Psion-developed Epoc 32 operating system got a new boost last month with news that it will run a version of the Oracle Lite database.

The OS was named as a major threat to Microsoft in the first of a series of internal memos leaked suspiciously close to that company's DoJ court case (*see p26*).

Epoc is now owned and developed by Symbian, a company set up by Psion, Nokia, Motorola and Ericsson. And, as *PCW News* pointed out after the Symbian launch, the Epoc challenge is real. Psion's Symbian partners own three quarters of the mobile-phone market and Epoc is considered better and more compact than WinCE.

Mobiles are a big opportunity for independent software developers because in the new, connected world the devices do not need Windows. The new Oracle Lite, for instance, will allow wireless access to major databases from handhelds.

Analysts say the range of devices the Symbian group makes would guarantee Epoc a huge market. Rob Hailstone, research director at Bloor Research, said: "Just because Microsoft owns the desktop market, it doesn't mean that by default it will own the mobile market. It is not a war yet, but the battlements have been put in place. The standard mobile device will not be a laptop computer. That is overkill."

ADDITIONAL REPORTING, LISA KELLY

Devices 'spark synchronisation crisis'

The proliferation of new information devices is a major challenge to IT managers, according to a report from Motorola. At least one in four workers uses a computer away from the office, and data from these diverse sources has to be synchronised into a single access point, it said.

short stories

PC SALES HOLD UP

The computer industry is not in as big a slump as expected, according to analysts IDC and Dataquest. They say PC sales in the US grew 20 percent in the last quarter, 6 percent above predictions. Latest figures show that while Asia stumbles, there is strong demand in Europe and the US, promising world growth of 18 percent for 1998. Barring any major downturn, demand will remain strong in the US as $699 and $499 PCs drive sales to new users.

TIM BAJARIN

CRYSTAL CLEAR ON NET

Seagate Software's new £309 (inc VAT) Crystal Reports 7.0 allows access to multiple databases over the web. Other new features include advanced mapping (*pictured, above*). An early version is bundled with Visual Basic, and users of this and rival products can upgrade for £149 (inc VAT).

Seagate 0181 566 2330

AUTOSKETCH 6.0

Autodesk has released its £99 (ex VAT) entry-level Autosketch 6.0, aimed at helping technicians without specialist CAD skills to draw concepts quickly and easily.

Autodesk 01483 303322

ANNUAL DATA

The 1999 edition of *The Computer Users Year Book*, the three-volume directory of IT sources, services and sites, is now available for £295 for the set. Individual volumes can be bought.

Learned Information 01865 388057

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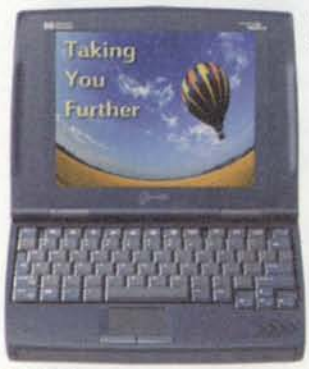
MOBILES ROUND-UP

The mini market

A new wave of mini-notebooks powered by the Handheld PC Professional version of Windows CE 2.0 is poised to steal away customers from the traditional handheld and notebook markets. Lighter and smaller than a notebook, yet more powerful and ergonomic than a palmtop, these so-called folio PCs are expected to make big gains during the next year over competitors such as the Sony Vaio.



Hewlett-Packard's Jornada 820 *(pictured)* is leading the charge, and has a keyboard and screen almost as large as a notebook. It is powered by the StrongArm Risc processor and uses far less battery power. Weighing in at only 1.8lb, it also comes with a 56K modem and 32Mb of RAM. The Jornada is expected to go on sale this month with an estimated street price of about £850. (*See also, Gadgets, p74.*)

Toshiba has released a 2.9lb mini-notebook with a magnesium case, the **Portégé 3010**. It has a 266MHz MMX processor and a 10.4in screen, and comes with a 4Gb hard drive and 32Mb of RAM. It costs £1,595 (ex VAT).

Sharp's upcoming folio PC, the **Mobilon Pro PV-5000**, also has a reasonably large keyboard and a large 8.2in colour touch-screen as well as a 33.6K modem. At about 2lb, it's also highly portable. Sharp says the Mobilon will be available early in the new year for around £80.

Toshiba 01932 828828 www.toshiba.co.uk; Hewlett Packard 01344 369369 www.hp.com; Sharp 0161 205 2333 www.sharp-usa.com

New CE, new mobiles

Several large form-factor mobiles running Handheld PC Professional, the latest version of Windows CE, were shown at the Microsoft's Professional Developer's Conference.

The Sharp Mobilon TriPad and the Vadem Clio, the same machine under different names, offer a 9.4in 640x480 256-colour screen, 16Mb RAM (upgradeable to 32Mb), software-based fax/modem and 12-hour battery life for $999. Sharp's demonstration TriPad was running full-screen Windows NT 4.0 applications thanks to the new Citrix ICA client for CE Pro. The Citrix ICA supports Windows CE running on MIPS, and Hitachi SH3, Intel x-86, PowerPC and StrongARM processors.

Meanwhile, Microsoft announced new developer services including MSDE, an SQL Server 7.0-compatible engine for Access 2000, and Agent 2.0 animated character technology, at the October 1998 Professional Developer Conference (PDC '98) in Denver. Agent 2.0 enables animated characters to be embedded into web pages that will be viewed on Windows PCs.

Microsoft Data Engine is an alternative to the Jet 4.0 Access 2000 storage engine. With MSDE installed, Access 2000 data, queries and reports can be shared transparently with, or migrated to, SQL Server 7.0. MSDE is also behind SQL Server 7.0 Desktop, the "lite" version of SQL Server for Windows 95, Windows 98 and Windows NT 4.0 Workstation announced at Comdex Fall on 16th November.

TERENCE GREEN

• *See also, News Analysis, p40.*

The new small notebooks

Toshiba's new 6.7lb Satellite 2515 CDS represents an aggressive expansion into the entry-level market. It looks like an Apple G3 PowerBook and sports a 266MHz MMX processor, 4Gb hard drive, 32Mb of DRAM, 56K modem, 24X CD-ROM drive and a 12.1in DSTN screen. At $1,399 it is $105 cheaper than IBM's ThinkPad series, thanks largely to the TFT screen IBM is now putting in all its laptops.

Toshiba's new mini notebook, the 2.9lb Portégé 3010, will give Sony's Vaio 505 a run for its money. It is almost identical in size and, in my estimation, with its sleek magnesium case, looks much better. It has a 10.4in TFT screen and uses a 266 MMX processor, a 4Gb drive and 32Mb of DRAM as standard.

Toshiba claims 3.5 hours of continual battery use. The suggested retail price is $1,995. The 505 has taken mobile vendors by surprise. For years, they resisted creating a product this small. I expect IBM, Compaq, Micron and even Dell to have competing products in this space by early 1999.

Another possible rival is HP's 1.8lb CE-based Jornada, which is about a fifth smaller than the Vaio and has a 9in DSTN screen and a 56K modem. Its 32Mb of DRAM serves as its storage medium but it boasts ten hours of battery life.

It has limitations, compared to a Windows 98 laptop, but costs well under $1,000. I've been using one for about two weeks and I'm quite impressed. My beta unit has some software glitches, but once it hits the market in early November, I'm sure it will be rock solid.

The new Sharp Actius 150 is also quite a product. It sports a 266MHz processor, a 4.3Gb drive, 64Mb DRAM, 2Mb video RAM and port replicator for about $2,500. Its main selling point is Sharp's new transflective screen, the brightest and sharpest screen of its kind. It will be in the UK by early 1999.

Tim Bajarin
letter from Silicon Valley

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SOFTWARE

Anti-piracy moves set sail

An anti-software piracy campaign condemned last year for its heavy-handed approach to enforcement has garnered the support of The Federation of Small Business.

For Crackdown 98, the Business Software Association (BSA) is sending out a Software Declaration Form to over 20,000 medium-sized UK companies. If a business does not complete and return the form within three weeks, it will be placed in the BSA's Software Watch database and will likely come under investigation by the BSA for software piracy. If found guilty, businesses face fines of up to £10,000 and could be "shamed in the press".

◄ FILL IT IN, OR PAY THE PRICE

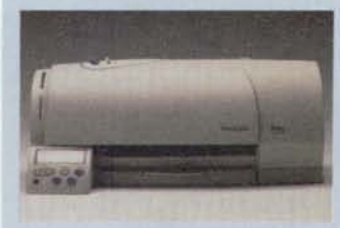
Ignorance of software piracy in your organisation isn't an excuse, the BSA says. "Companies have to make an active effort to find out what is on their computers," says Mike Newton, campaign relations manager. "There's no excuse for piracy. But in the case of small and medium businesses which are growing, it may not be at the top of their agendas."

The BSA's aims are admirable, says Stephen Alambritis of the Federation of Small Business. However, the BSA should exercise a bit of patience when it comes to otherwise honest businesses. "There should be punishment, but not enough to bring down the business into bankruptcy. We estimate that most of the rogue software is in use by shadowy businesses, not honest ones."

The Business Software Association came in for criticism by many small businesses last year when it sent out what they said were "threatening" letters demanding they fill in its Crackdown 97 questionnaire. Many small businesses described the BSA's enforcement methods as high-handed.

Phone for The BSA's Guide to Software Management on 0800 510510 or see www.bsa.org/uk

Snappy printer



Lexmark's latest printer has been designed with the digital shutterbug in mind. The Photo Jetprinter 5770 is a two-in-one inkjet device that can handle photo printing as well as more ordinary printing tasks. The 5770 also allows users to store and edit their pictures before printing. The printer accepts both CompactFlash and SmartMedia cards, meaning that the PC can be bypassed altogether. It also supports the Iomega Zip drive. The 5770 should be available later this month and will cost £349 (297 ex VAT).

Lexmark 01628 481500
www.lexmark.co.uk

Company sees red at green PC initiative

A leading **computer recycling company** has criticised the latest draft of the EC Environmental Directive as "uneconomic, contradictory and unworkable". Technical Asset Management (TAM) says that the definitions of "recycling" and "waste" are unclear, and that there is confusion about who has responsibility for disposing of a PC if it is refurbished.

On a similar note, the DTI has told businesses to stop throwing away their old computer equipment. It has produced a guide that helps businesses find a good home for their old PCs, called *Unwanted Computer Equipment: a Guide to Re-use*. By passing old hardware on, they could make a real practical contribution to people in the community, said Consumer Affairs Minister, Dr Kim Howells.

TAM 01707 333555
DTI 0171 215 5822

Digital diary

Why not get organised in the New Year with the digital version of the Economist Diary Companion 1999 for the Psion palmtop PC? The diary includes the usual reference data as well as a glossary of computing terms, and also automatically transfers important dates and holidays to your agenda file. It costs £17.95 including VAT (via download or mail order) or £19.95 if you buy it in the shops.

On-Board Info 0171 370 0307
www.on-board-info.com

Bright eyes

First it was the ergonomic keyboard, then the wrist rest: now there's a product designed to take the strain off the old peepers. PC Eyes is a combination of natural plant extracts, including guarana, bilberry, eye bright and feverfew, that helps combat dry, tired and strained eyes. Being bright-eyed and bushy-tailed, we haven't tried PC Eyes for ourselves, but it's available for £17.95 for 60 tablets.

Herbal Solutions 01483 204427

Fully booked

Makers of electronic books have agreed on open technical standards for the new technology. These new standards mean that devices from different manufacturers will be able to read the same electronic text without having to reformat it first. The new Open ebook specification will be based on HTML and XML web languages.

USB

Peripherals take the bus

The robust USB driver in Windows 98 has at last persuaded vendors to launch peripherals using the new, fast serial port. Another spur has been the introduction of Apple's new USB-equipped iMac, which lacks a floppy drive. Teac announced a USB floppy, which will get an iMac driver soon, but this is expensive at around £100. A better bet for both the PC and iMac platform is one of the superfloppy drives (*see News Analysis, page 42*), all of which have USB versions in the pipleline.

Saddest entry into the market was Syquest, which said it would ship a USB version of its SparQ drive this month for less than £200 – with 1Gb removable cartridges costing £49.99 each. A SCSI version was also announced, but shortly after, Syquest temporarily ceased trading, though both company and drives may survive (*see page 26*).

Pace introduced a colour video camera, designed to sit on your PC, for just £89. Roland, via its new company Edirol, announced three new USB devices: the Super MPU-64 64-channel MIDI interface, the MA-150U 30W stereo speakers, and the Audio Canvas UA-100 audio and MIDI unit.

Pace 0990 561001
Edirol 0181 956 2224

Why use USB?

The main advantages of USB, which is expected to oust the PC's traditional serial and parallel ports, are:

- **Speed.** Up to 12Mbit/sec, around 100 times faster than the current serial port.
- **Plug and Play.** No need to mess with interrupts and addresses.
- **Hot-plugging.** No need to switch off the computer when changing devices.
- **Fewer leads.** USB devices can be daisy-chained, avoiding a mass of wires at the rear of the PC.
- **Power supply.** Devices can draw up to 2.5W of power from the USB, and so may not need mains cables or adapters.

Businesses tap into telephony potential

Internet-initiated telephony, which sets up voice calls with web-site visitors, is yet another avenue of telecoms pushed out from Silicon Fen. NetCall has put hundreds of net traders in contact with thousands of customers at sites like Thomas Cook Holidays. It is also used by the *Electronic Telegraph*'s Kindred Spirits dating service.

NetCall introduced its webcall button back in 1995, and technical director and MD John Burnett believes it remains ahead of rivals. If you click a button to get a voice link and the service or trader you want to contact is not available, a fax (or email or SMS message) is sent instead. It works if you happen to be out of the country, or trying to access an 0800 number not normally possible from beyond these shores, because NetCall can initiate the call from within whichever country offers the cheapest rates.

The firm has a client base of some 1,400. But many traders do not yet understand its value, says Burnett. "There is a learning curve that has to take place out there. A potential customer can place calls without using telephone dialling, but you don't need a multimedia PC at either end for the voice part of the call."

You can also use voice over the internet between gateways for long-distance calls, using the NetCall HyperPhone link. At Askalex.com, where NetCall links up more than 1.8 million UK businesses with potential customers, 2,500 enquiries are made per hour. At the other end of the scale, NetCall connects a database of US bed-and-breakfasts (who don't all have a PC) with UK visitors.

NetCall's standard charge UK-to-UK is 6p per per minute, while to the US it is 11p. NetCall's service is also used for conference calls of up to eight parties. Burnett claims pricing is about one-fifth of the BT equivalent, with no setup charges: "We are looking to make our service pay by the sheer volume of people who are attracted by what our services offer, anywhere in the world." For a call anywhere in the US, NetCall charges $3 a month for a button/link plus $0.18 a minute.

www.netcall800.com or www.netcallplc.com

- **Cambridge astronomer** Peter Duffet-Smith has invented a way of using the cellular phone infrastructure to give people exact information on where they are. The technology originated in the Cavendish lab and Duffet-Smith joined Cambridge Positioning Systems last year to develop the system, called Cursor. It is due for a nationwide rollout next year.

Cursor involves only a minor software upgrade to any GSM mobile phone and is available for use with emergency services as well as business and consumer information needs. Future applications are boundless, says chief executive Geoff Morris. "People will be able to use their mobile phones to obtain local information which relates to their immediate locality such as the nearest bank, or how to get to the nearest hotel." A demonstration network is up and running in Cambridge in close collaboration with development partner Scientific Generics.

www.cursor-system.com

Caroline Swift *continues her reports from Silicon Fen*

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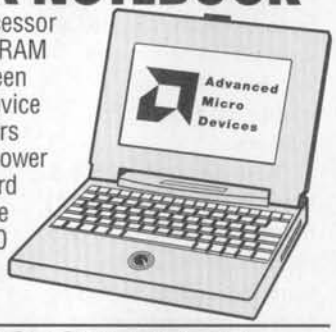

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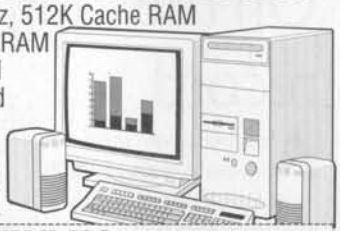

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INSURANCE

PCs fully covered

An insurance scheme launched last month provides a fallback for people who fear buying PCs from smaller dealers. Users pay from £50, depending on the price of their PC, for a guarantee that they will be able to get faulty machines repaired, even if the vendor goes bust.

The scheme, Insured Warranties, was launched by the Personal Computer Association, which represents some UK vendors. Executive Director Keith Warburton said that all too often, companies with little or no track record advertise PCs with a three- or five-year guarantee which is worth nothing if the supplier goes bust. "Even if the seller provides on-site service through a third-party maintenance company, the customer is unprotected if the maintenance company goes out of business too."

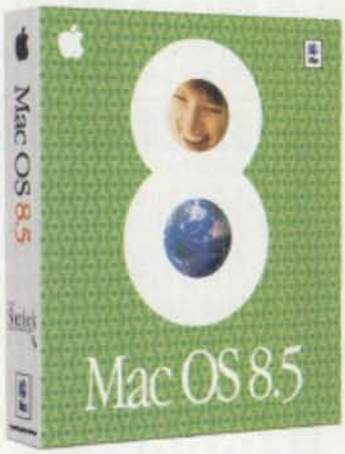
PCA 01763 262987

OPERATING SYSTEMS

New MacOS fights off NT

Apple, buoyed by news of its first profitable quarter in four years, has launched a major upgrade to its operating system with features clearly designed to stave off the threat from Windows NT in its traditional graphics markets.

The move to Mac OS 8.5 from the current version 8.1 represents a far greater jump than the previous move from version 7.5, according to product manager Jonathan Ferman.



Leading the new feature is an extended Finder module, called Sherlock, which operates both locally and across the internet. On the user's PC (if Apple's hype is to be believed) it operates as a powerful text retrieval tool, indexing every word in documents in your hard disk and responding to natural language queries. It will also summarise documents.

Sherlock will also put the same query to a series of search engines, ranking the responses in terms of relevance.

Yet, perhaps more important to Apple's future, are features designed to help professional users, many of whom have been drifting to the Wintel platform. Network performance has been improved and Applescript extended to enable automation of almost any routine operation, including cross-application tasks. This brings it into line with the kind of thing you can do with Visual Basic for Applications.

Off the record

A problem with most fax-modems is that your PC must be switched on for you to receive data and messages. Some models have got around this by including storage for voice and fax calls. Now Lucent has enhanced its Venus modem chipset to make these much easier to manufacture. Implementations from Kortex, Hayes and Paradise are available or are imminent.

Details are at www.lucent.com

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MISTRAL
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Windows gets the network message

Terence Green looks at how Windows will survive the inevitable flood of non-Windows devices.

The internet and digital appliances have pushed Microsoft into adopting network computing, but only on its own terms. Its new applications architecture, Windows DNA, is prepared for the inevitability of a proliferation of devices which don't run Windows.

Given the number and variety of emerging models, from handhelds through screen phones to digital TVs and set-top boxes, not even Microsoft could come up with enough operating systems to cover the waterfront. Accordingly, at October's Microsoft Professional Developers' Conference (PDC 98) in Denver, Bill Gates entitled his keynote speech "Building Windows-based Applications for the Internet Age".

By this, he meant Windows applications for non-Windows devices. Your screen phone, say, may not run Windows, but Microsoft can still get it to front an application running on a remote Windows NT (or Windows 2000, as the next version is to be called) server. The enabling technology is Windows Distributed interNet Applications (DNA) architecture, which turns the presentation, execution and data access layers of Windows applications into distributed components.

The core technology of Windows DNA, COM+, is available only on Windows NT and likely to remain that way. However, because the presentation component can speak HTML, the *lingua franca* of the internet, it can display on any client. Windows DNA is a smart move as it protects Windows investments by redefining the Network Computer as NT-dependent.

An earlier attempt to co-opt the NC for Windows, the NetPC, entirely failed to excite interest. However, customer reaction to another network computing technology, Windows Terminal Server, really set the bells ringing at Microsoft. Windows Terminal Server is a Unix-like multi-user system for Windows NT, developed for Microsoft by Citrix. It is technically complex but simple in concept: run the application on Windows NT and transmit the screen display to the client, thus enabling any machine to "run" Windows applications.

▶NON-WINDOWS DEVICES CAN BE MADE TO FRONT AN APPLICATION RUNNING ON A REMOTE NT SERVER

Terminal Server is the graphical-screen version of the old text-based dumb terminal. Gates called it "fantastic" but noted that it is aimed at users who "have worked with terminals in the past". Microsoft's real problem with Terminal Server is that it owns only the code that enables Windows clients to access the server. Citrix owns the code for all other clients: devices supported by its MetaFrame add-on include Macs, Unix clients, web browsers, Java-based clients and Windows CE handhelds. In fact, Citrix was at the conference displaying Windows NT 4.0 on a Sharp Mobilon TriPad, which was itself running the new Windows CE Professional Edition for larger-format handhelds and accessing Citrix MetaFrame over a high-speed Proxim wireless connection. If the thought of Microsoft Office running on a Windows CE handheld gives you a hot flush, call Citrix now. However, this is not Microsoft's preferred option. Its way of protecting its investment in the Windows API is to create an applications layer tied to the server. Enter the Windows DNA architecture, which it has evangelised for the past year.

It's hard to disagree with the value of network computing

PDC '98 was the call to action for developers to begin building Windows DNA applications. Gates described DNA is an n-tier model because you must be free to move the code tiers around in order to accommodate different clients with differing levels of support for the presentation level. You may even want to run all tiers on a single computer as in the case of a Windows PC. This would please Microsoft the most. As soon as you separate the tiers, Windows NT Server comes into play, as Gates demonstrated with a laptop running a sales order application. The user experience was the same whether or not the laptop was connected to the network. The application validated customer numbers and checked product details exactly as it did when network-connected.

Queued Components, the technology that makes this possible, enables disconnected asynchronous working thanks to the store and forward technology of Microsoft Message Queue Server which, together with Microsoft Transaction Server and Microsoft Common Object Model (COM), comprises COM+.

Since Microsoft Transaction Server and Message Queue Server only run on NT, Windows-based applications will be entirely NT-dependent. This is smart footwork by Microsoft because Windows programmers will flock to DNA and thereby ensure the future of NT. Some will criticise Windows DNA simply because it emerged from Microsoft, but it's hard to disagree with the value of network computing, as the emergence of Windows DNA acknowledges.

short stories

IBM GUIDES THE BLIND
IBM has created the equivalent of a guide dog for blind internet users. The IBM Home Page Reader, which uses Netscape Navigator 4.05 in Windows, reads

HTML text as well as links, frames and tables. It is the first product of its kind that is compatible with the latest plug-ins and also accepts voice commands through IBM's ViaVoice software. The browser reader goes on sale this month for US$149 and can be ordered from IBM's special needs systems page.
www.ibm.com/sns

VIRGIN KIOSKS
Virgin Megastore customers now have the chance to surf the web in-store after they pick up a CD or video. Virgin Net is installing internet kiosks in 40 stores across the country that will allow customers to watch music webcasts and celebrity visits, and take part in exclusive competitions. Virgin says that its filtering software should keep children from accessing inappropriate sites.
www.virgin.net

ART AUCTION
An art and antiques dealing company has launched an online-only service that lets collectors bid on lots from auction houses around the world. Interactive Collector is offering items as varied as Titanic memorabilia and photographs taken by film star Richard Gere, with prices ranging from $80 to $34,000.

www.icollector.com

TRAVEL

Sun rejoins the browser business

Sun is getting back into the browser business, announcing plans to revamp its Hot Java to ensure there is at least one browser on the market that is fully Java compatible. Prompting the action, to some extent, was Netscape's decision earlier this year to postpone development of its Javagator browser due to lack of resources [*see story, below*].

Scott Ryder, product manager for Sun's web product line, said the update will give corporations a worthy alternative to Microsoft's Internet Explorer. "Because the browser market continues to solidify around Microsoft, companies that are in the solutions business or the content business face a serious risk," Ryder said. He claimed that Microsoft is configuring its browser to drive traffic to its own sites.

He added that the current product from Sun, Hot Java 1.5, is not positioned to target the commercial browser market. Instead, Sun has targetted the Java browser for OEMs and developers to bundle with their own web-enabled devices and applications.

Early in 1999 Sun will reportedly roll out a revised version of the product, featuring support for cascading stylesheets, Dynamic HTML, email, newsgroups, and Real Audio and QuickTime. Today's Hot Java lacks these capabilities.

JOHN GERALDS, VNU NEWSWIRE

www.sun.com

Domain names

The internet domain name registry system will likely be run by an international, non-profit organisation when Network Solutions' contract expires next year. The Internet Corporation for Assigned Names and Numbers (ICANN) has elected an international team to lead the transition, appeasing the EU's fears that the US would dominate the process. ICANN hopes to agree on a system for creating new domain names as soon as possible.

By George, it's Bill

Don't be alarmed if you get Bill by mistake the next time you pop George's CD into the stereo. MSN is hoping to boost its audience numbers by embedding software links to its site in music CDs by major label artists such as George Michael. His greatest hits album, which was released in November, also has links to Hotmail.

Communicator and Explorer get a facelift

Netscape is steaming straight ahead with the launch of **the beta of Communicator 4.5**, seemingly undeterred by the failure of Javagator, the ill-fated Java browser it killed off last summer.

Communicator 4.5 features Smart Browsing, which lets users type only a few key words into the address bar (such as Manchester United FC) in order to be taken directly to the desired site. It also displays a list of related sites.

The new beta also has a new version of Netscape Messenger, its high-speed email product, and comes with pre-installed software such as Flash and RealPlayer.

• The first **public beta version of IE 5.0** has also been unveiled. Microsoft says the new browser's Intellisense features, such as automatically correcting common URL errors, will make it much easier to use. Content providers, such as the New York Times and Bloomberg Financial Markets, can now import content straight into a separate pane in the browser.

www.netscape.com/uk
www.microsoft.com/windows/ie

Sony aims Hi in the superfloppy stakes

Clive Akass looks at the latest contender in the race to provide a successor to the floppy disk.

Sony joins the long-running battle of the superfloppies this month with the launch of its HiFD drive, which reads new 200Mb disks as well as 1.44Mb floppies. The company hinted at a future multi-capacity drive that will read capacities from 1.44Mb to 600Mb.

The HiFD is bound to renew interest in a successor to the traditional floppy, although the first version is unlikely to shake the world. It's a sluggish £149 (inc VAT) parallel-port model aimed at people wishing to upgrade a PC, or to add storage to a notebook.

More interesting is a much faster (*see panel*) bootable HiFD, scheduled for early next year, which will probably use an EIDE bus daisy-chained from a hard disk. Sony will try to persuade PC makers to use this instead of a standard floppy. Iomega's 100Mb Zip and the 120Mb SuperDisk LS-120 (aka the A: drive) have been fighting for this market for more than three years. The slower LS-120 got off to a poor start with BIOS problems, but is being fitted in an increasing number of new PCs. It can read standard floppies and is made by three of the biggest names in the business — Imation, Mitsubishi and Panasonic, and so can match Sony's brand strength. PC makers can buy an LS-120 for as little as £32, and save £12 or so on the cost of a standard floppy, so it adds only £20 to a machine's total cost. The Zip costs little more but cannot read floppy disks.

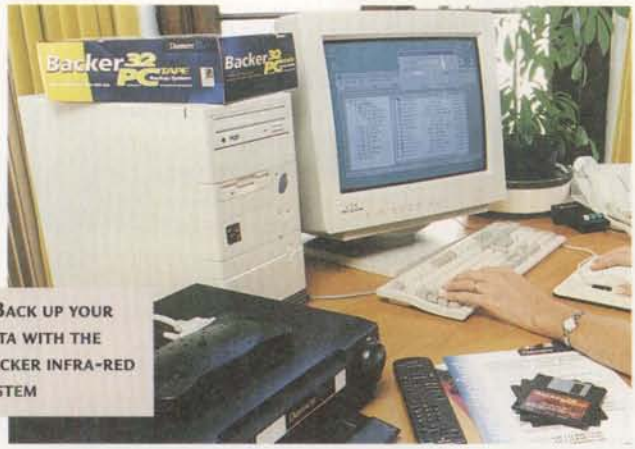
The HiFD drive reads 200Mb disks as well as 1.44Mb floppies

HiFD product manager Mari Oda said Sony "aimed to be competitive" with these prices with its internal model, which will also be made by ALPS and Teac. She also said a notebook-ready thin version is in the pipeline. "And this technology has a lot of headroom. We can double and even triple the capacity." The first HiFD models will not read these high-density disks.

Marcus Heap, Imation's European LS-120 business development manager, doubted if Sony could make a HiFD cheap enough to challenge the LS-120 because its two-speed step-motor made it inherently more expensive. "We can also produce drives with much higher capacities and we will do so if there appears to be a demand. But we have concentrated on bringing down costs because that is what PC makers want."

Iomega's Zip might seem to have won the battle for market share, despite its lack of backwards compatibility. It is a must-have in many offices because the cartridges have become a common exchange medium. Yet some believe the Zip has come close to saturating its natural market as an easy upgrade option. Heap quotes IDC figures indicating that Zip sales fell from 360,000 in the first quarter of this year to 309,000 in the second, while LS-120 sales rose from 118,000 to 177,000. Sales have since been further boosted by a new slim model that is being fitted to an increasing number of notebooks, Heap claims.

There is a warning for Iomega in its own history. It wiped the floor with Syquest with the Zip at a time when rival Syquest drives were seen as a *de facto* standard. One industry insider said: "Market share is no guarantee of success. It gives you a two-year edge. That is all."



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Incidentally...

At the other end of the storage scale, Danmere (016606 74330) has introduced a £25 infra-red add-on to its Backer back-up system (*left*) that uses a PC to control a home video-recorder as a backing-up device.

RIVAL 4 drives

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Zip drive
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Sony HiFD
Parallel-port HiFD transferring 200Kb/sec launches this month. Bootable internal version, due in the new year, has a claimed transfer rate of 3.2Mb/sec. Disks cost £11 inc VAT. www.sony.com

SuperDisk LS 120
Internal kits from £57.57. Data transfer rates vary but generally slower than the Zip. 120Mb disks cost from £9 inc VAT. USB version imminent. Imation 01344 402200

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"Stunning"

Personal Computer World - April '98

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Christmas Price Crash

"MESH has trumped all other contenders with this machine - a stunning configuration. The whole package screamed class right from the start. Good points: too many to list here. Superb value for money.

Performance	★★★★★
Value for money	★★★★★
Overall Rating	★★★★★

Our Editor's Choice award goes to a machine that was head and shoulders above the others. Machines with specifications like this set the standards for other manufacturers and ensure that you don't need to have won the lottery to get your hands on very desirable kit. MESH won by a mile."

Personal Computer World Editors Choice

PCW Editor's Choice - April '98

"Impressive performance and stunning value shows that MESH still knows how to put together a top notch system.

Peformance	★★★★★★
Value for money	★★★★★

This is absolutely stunning value, the MESH performed extremely well in our benchmark tests. This is a very fast PC at an astonishing price."

PC Pro - April '98

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- Intel® 440BX AGPset - *upgradeable to 450MHz*
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PC Pro
August '97

Multi-award winning PC with 17" Trinitron monitor

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"The Pegasus is ridiculously good value. Armed to the teeth with features... excellent performance... extremely attractive price."

PC Advisor
January '98

Christmas Price Crash Christmas Price Crash Christmas Price Crash Christmas Price Crash Christmas

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- 8.4Gb Ultra DMA Hard Disk Drive
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- Stereo Amplified Speakers
- Latest 56Kbps Voice Fax Modem with Pipex Internet Access*
- Free Software: Lotus SmartSuite 97

Processor	Excl.VAT	Inc.VAT
Intel® Pentium II® 350	£999	£1173.83
Intel® Pentium II® 400	£1099	£1291.33
Intel® Pentium II® 450	£1225	£1439.38

MESH Elite Pegasus

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- Matrox G200 8Mb AGP SD Card
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- Iomega 100Mb Zip Drive and Disk
- *New* 17/40x Speed CD-ROM Drive
- Creative Labs Audio PCI 64V
- Stereo Amplified Speakers
- Latest 56Kbps Voice Fax Modem with Pipex Internet access*
- Free Software: Lotus SmartSuite 97

Processor	Excl.VAT	Inc.VAT
Intel® Pentium II® 350	£1199	£1408.83
Intel® Pentium II® 400	£1299	£1526.33
Intel® Pentium II® 450	£1425	£1674.38

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Lights, camera... action!

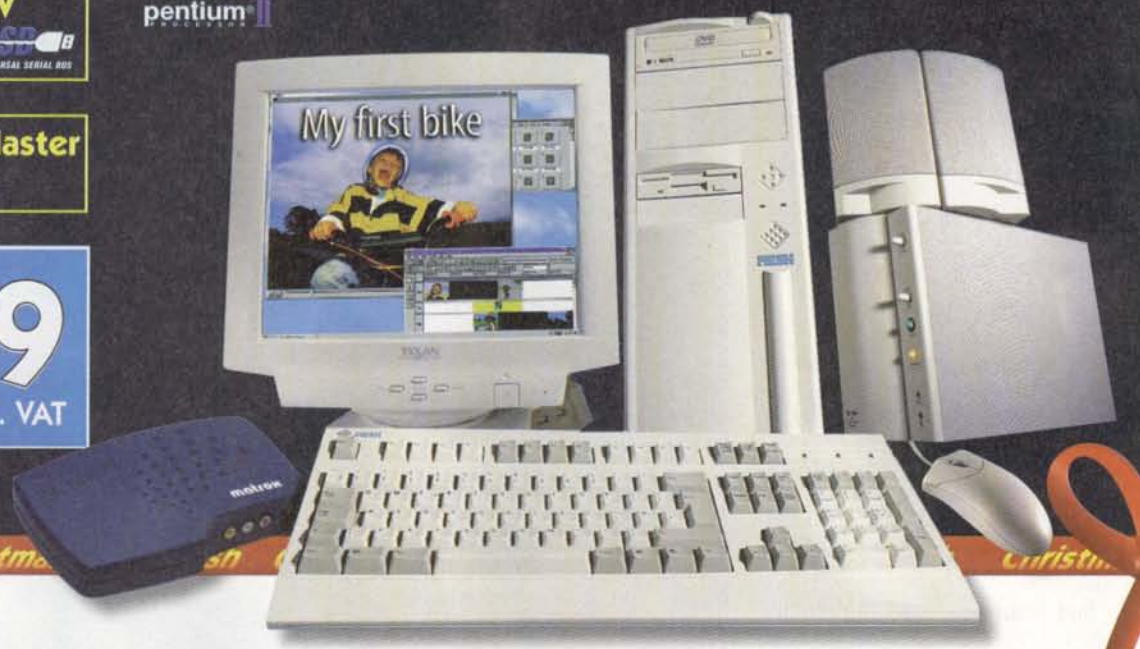
8Mb Matrox Marvel G200 AGP Video Card

17" Taxan 735 EV Monitor

Creative Labs SoundBlaster Live Sound Card

£1399 incl. VAT

intel inside pentium II



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Fancy yourself as a budding Spielberg, Kubrick or Hitchcock? With the new MESH 350 Studio Pro making movies couldn't be easier.

POWERED BY matrox

The Marvel G200 video card offers the most comprehensive, all-in-one graphics solution with acceleration for 2D, 3D, DVD video, hardware MJPEG video editing, PC to TV output, video conferencing, live video capture, and more. It features 8 MB of memory, the MGA-G200 graphics chip, and easy-to-use Avid Cinema video editing software. This all-in-one video card truly does it all!

In conjunction with the amazing Creative Labs SoundBlaster Live sound card the 350 Studio Pro will ensure that Hollywood is only a small step away.

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- 17" Taxan 735 Ergovision TCO99
- 8Mb Matrox Marvel G200 AGP Video
- Creative Labs SoundBlaster Live*
- Labtec Speakers and sub-woofer
- New Web Cruiser Mouse
- 56Kbps Voice/Fax modem
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Doesn't it annoy you when something doesn't meet its promises?

Every Christmas we find new ways to hide our disappointment. It shouldn't be like that with your Internet service. This is one time you should always get exactly what you want.

So if you're offered an Internet service so slow it takes all day to get anywhere, or the provider throws in so much pointless content that it takes you too long to find what you need, maybe it's time to think again.

Take a look at Direct Connection. We only provide a fast, reliable and economical Internet service. You get unlimited email addresses, enough space to build a proper Web page and excellent technical support. That's why most of our business is from personal recommendation.

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Direct Connection

short stories

SAVE THOSE CHILDREN
Demon Internet is offering a free guide for parents and teachers about how to navigate the internet efficiently and safely. The guide explains what the internet is, for what it can be used and how to protect children from its more unsavoury elements.
Demon Internet: 0800 027 0127, www.demon.net

AMAZON IN THE UK
Amazon opened the doors of its online bookstore here in October. The site features nearly 1.5 million titles, including all UK books in print, and offers savings of up to 40 percent off high-street prices. The site replaces the UK-owned Bookpages.
www.amazon.co.uk

E-COMMERCE

It's e-trade or bust, says report

E-commerce will spur economic changes as radical as those caused by the development of the printing press, a leading analyst has claimed.

Furthermore, he claims, businesses which do not seize potential ecommerce opportunities will be driven out of the market by their leaner, electronically-based competitors.

Robin Bloor, CEO of Bloor Research, made his comments at the launch of the report "*eRoad: Everything you always wanted to know about ecommerce but were afraid to ask!*" He says that businesses have to realise which way the economic tide is turning. "If your business is being undermined by the internet, you won't get a second chance," he said. "You'll be blown out of the water."

ROBIN BLOOR, CEO OF BLOOR RESEARCH

Bloor pointed out that virtually every business transaction can be made more cheaply over the internet. Whereas an airline ticket costs up to $8 to process through a ticket agent, it costs only $1 when it's booked on the web. Eventually, he predicts, the development of an electronically-based economy will drive the world toward one set of technical standards as well as one currency.

"Standards will prevail because the web cannot tolerate competing standards. XML will win, and at the end of the day, Microsoft and Netscape will collaborate on a browser," he said. "There will also be a battle for supremacy between the Euro and the dollar. The only thing that could stop it is the people with guns and cruise missiles. If it's up to the economy, it will be one world."

• **Analysts Frost & Sullivan** have also predicted that the European ecommerce market will experience "colossal growth" in the next six years. Not only will revenues skyrocket from US$36m in 1997 to $8bn by 2004, it claims, but consumer internet users will shoot from 9.9 million to 44.9 million in the same period.

Student action on the net

Sixth-form students can now get help choosing the best course and university from a web site designed by a first-year undergraduate. InfoYouth, which is aimed at 16-24-year-olds, provides electronic university prospectuses as well as information about various career and gap year opportunities from more than 40 organisations.

The site also features online discussion groups where students can chat to each other about university, career and gap year issues. www.infoyouth.com

CompuServe into 2000

CompuServe's next-generation client software has entered beta testing and will be available early this year, claims the company. CompuServe 2000 will provide access to CompuServe's new service, featuring enhanced content including a PA newsfeed and the Instant Message online chat program.

CompuServe 2000 has a very similar look and feel to AOL 4.0. It will use HTML to display its online content for the first time. Users get five email addresses, enhanced email functionality and the Contact List, which tells users when their friends are online. There are still a few bugbears, though. There's no offline reader and no immediate plans to support CE or provide a Mac version.

CompuServe says it will continue to support any users who are unwilling or unable to upgrade.

Take IT from those in the know

Phoenix, Arizona is where the big IT honchos outline their future plans. Tim Bajarin was there.

The annual Agenda event at Phoenix, Arizona, brings together heads and other top executives of companies which are shaping the future of the IT industry and the internet. You can rub shoulders with Intel's Andy Grove, Oracle's Larry Ellison, Compaq's Eckhard Pfeiffer, Gateway's Ted Waitt, and Steve Forbes, chairman of *Forbes Magazine*. This is perhaps the only conference where such heavyweights not only speak, but also sit in the audience and take notes.

I spent some time with Andy Grove, who has turned his role as Intel's president and CEO over to Craig Barrett and now serves only as chairman. But he told me he is as busy as ever, putting all his energy into strategic planning and extending Intel's product reach beyond the traditional PC. He says he has fully recovered from prostate cancer, and supporting the search for a cure for this disease is the only non-Intel project he spends any time on. In his Agenda 99 speech he announced two key programmes that will impact Intel products. He showed a live demo via satellite of what he calls microsurgery, a technique for speeding up development times by drilling through multiple layers of silicon to fine-tune microcircuits. This, and Intel's 0.18 micron technology, will push 32-bit chip speeds up to 900MHz by mid-2000.

Grove hinted that the same technology would make 64-bit chips much more powerful. He also showed some of Intel's new multiple-processor configurations, such as a 16-way system running various operating systems including tBeOS, NT, Unix and Linux – emphasising the fact that Intel is expanding its horizons beyond Microsoft's visions.

◄LONDON MARKETING AGENCY RANIER RECKONS IT HAS CUT INTERNATIONAL CALL COSTS BY 75 PERCENT USING INTERNET TELEPHONY; CISCO CHAIRMAN JOHN CHAMBERS PREDICTS SUCH VOICE-CALL CHARGES WILL FALL TO ZERO WITHIN FIVE YEARS
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Cisco chairman John Chambers pointed out how the new networks will integrate voice and data, with voice calls making up 15 percent of internet traffic (*pictured here*). He predicted that within five years voice calls will be free. He also said education will never be the same again. The "knowledge worker" will have to learn five to ten new skills a working lifetime and will thus regard learning as a lifetime experience. He called for schools to put new emphasis on teaching how to learn. A programme he has established in one school could be widely adopted, he said. It seems schools who install networks find they cannot afford to run and maintain them. Chambers set up a course to teach pupils to do the work, which means the school gains and the kids can get work straight from school.

The Asian crisis heralded dangerous times ahead

Chambers also predicted a rapid globalisation of business over the net which will level the playing field for all companies in an online market worth between $1 and $2 trillion within seven years. By contrast, Steve Forbes said the Asian crisis heralded some dangerous times for world economies over the next few years. Bad bail-out deals which ignored fundamental problems meant various Asian economies will struggle for some years. He feared the potential collapse of Russia, and Asia's problems will soon spread to South America. But he, too, remained bullish about the net economy. Forbes ran for president in 1996 and his speech was so politically correct that I suspect that he plans to run again in 2000.

The other key Agenda 99 theme was information appliances. Many spoke about the development of these devices for use within the home and stated this is where the next standards war will take place. Bill Joy, co-founder of Sun and a key developer of Java and Jini, echoed this sentiment and showed how Jini is the proper control software layer for any information appliance.

Notably absent at this year's conference was Bill Gates. Gates normally attends, sitting at the back and taking it all in. He then serves as the final speaker where he talks about Microsoft's goals for the next year. The conference took place on the first two days of the Department of Justice trial and he probably stayed away from the media at the conference and its attendees who could ask him some very difficult questions.

Agenda continues to be the premiere event for the PC industry, and considering the high-level executives who attend each year, it appears to be the main place to set our industry agenda each year for a long time to come.

short stories

INTERNET TELEPHONY
A European internet telephony operator says it is unlikely to offer services in the UK because our telephone charges are too competitive. Teledirect is offering a phone-to-phone IP telephony service for corporate networks and consumers in Spain, Hungary, Switzerland and Italy which gives savings of up to 80 percent on international calls. But it says the UK's deregulated telecoms market would make it impossible for it to compete here.

ETI CONSORTIUM
Petrol pumps and vending machines could soon be hooked up to the internet if a new initiative takes off. The Embed the Internet (ETI) consortium, which includes Sybase and SAP, aims to connect non-PC devices to networks, allowing remote control and monitoring. A number of different companies have announced products for such devices, including Emware, whose Emit software can connect 8-bit and 16-bit machines while using as little as 1Kb of memory.

NET MUSIC

Dancing in e-street

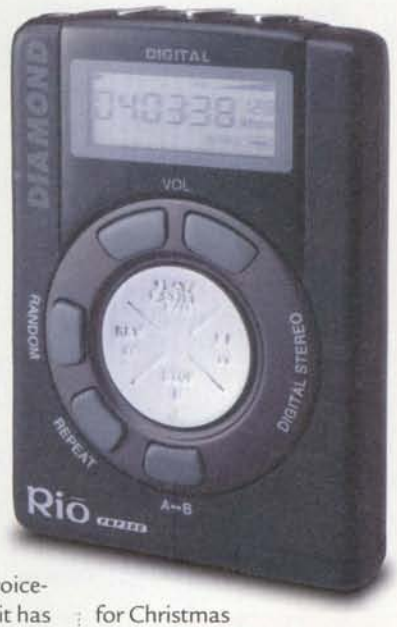
An internet music player accused of promoting piracy has caused a storm of controversy in the US. Now it is set to be released over here.

Diamond Multimedia plans to launch the Rio PMP300 in the UK in November. It is a Walkman-like device which stores and plays music downloaded from other CDs or from the internet.

The Rio has been denied a smooth entry into the market, however. Recently, the Recording Industry of America (RIAA) sought an injunction against Diamond, saying that the device would lead to an increase in piracy and would cost them billions of dollars in lost sales. The suit was rejected by a US federal court and the RIAA is now appealing. The case is being watched closely because it will likely set an international precedent about the legality of such devices.

Diamond Multimedia has now teamed up with four other companies to push the MP3 format and educate consumers about music piracy.

Neil McGuinness, Diamond's PR manager for Northern Europe, said: "We're actively looking to promote legal MP3. But piracy is a problem no matter what medium you're using, whether it's cassettes or CD-writers."



The Rio uses the MP3 internet music format and can store up to 60 minutes of digital-quality music and up to 16 hours of voice-quality audio. Because it has no moving parts, music will not skip during playback. Add-on flash memory storage cards are also available. Diamond says it has already received a great deal of interest in the device, which will likely cost around £175 (inc VAT) retail.

• **Another firm, Empeg,** which is based in Somerset, also plans to release an internet music player in time for Christmas '98. Unlike the Rio, it is designed for car use only and can store 35 hours of music downloaded from the internet. The player will cost around £699 and is expected to be sold over the net only.

Samsung Electronics was expected to release a portable MP3 music player in the US before Christmas, despite the injunction against Diamond Multimedia.

SUSAN PEDERSON

Yell Top 10 web sites

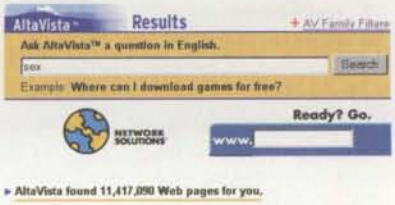
1. Harper Collins www.fireandwater.com
2. Grooverider www.grooverider.com
3. Cluedo www.cluedo.com
4. Ninja Tune www.ninjatune.net
5. Boddingtons www.boddingtons.com
6. Egg www.egg.co.uk
7. Standard Life www.standardlife.co.uk
8. Selfridges www.selfridges.co.uk
9. Richer Sounds www.richersounds.com
10. ASH www.ash.org.uk

Will you be making any New Year resolutions in 1999? I'm planning to raise a glass of Boddingtons and waste my money downloading all those classic TV ads from www.boddingtons.com. By 'eck, you do smell gorgeous tonight, petal!

Take a closer look

AltaVista has revamped its search engine to make it easier for net users to find what they're looking for. The three main search techniques are now all combined on the starting page as AV Full View Searching. Users can make an index or directory search, or try a question-and-answer search where they can pose a question in plain English and get one or two most relevant answers. It also features the handy AV Photo Finder as well as the AV Family Finder, which, it claims, will filter out potentially offensive sites while you're making a search.

www.altavista.com or www.av.com



Top 10 products

Last month

Peripherals

1	3Com 56K V90 Voice/FX Ext	3Com	3
2	UMAX Astra 610p	UMAX	1
3	UMAX Astra 1220p Scanner	UMAX	2
4	P75 To P200MMX Evergreen	Evergreen	4
5	MS Wheelmouse PS2/Serial	Microsoft	5
6	Tashika 56K Internal Modem	Tashika	-
7	SoundBlaster Live PCI	Creative	12
8	Mitsumi PS/2 Mouse	Mitsumi	8
9	Tashika 56K Flex External	Tashika	6
10	UMAX 1210p	UMAX	36

Windows software

1	MS Encarta Ref Suite 99	Microsoft	-
2	Masterclips 150,000 Clipart	IMSI	4
3	OfficePro+Bookshelf U/G	Microsoft	5
4	Windows 98 UG CD	Microsoft	2
5	Partition Magic 4.0	POW	-
6	Norton Systemworks v1	Symantec	45
7	Office 97 STD C/VUP UG CD	Microsoft	6
8	MS Visual Studio Edu CD	Microsoft	12
9	Partition Magic 4.0 U/G	POW	-
10	MS Student Win98/NT U/G	Microsoft	14

DOS software

1	Turbo Pascal v7.0	Borland	1
2	Norton Commander V5	Symantec	27
3	Turbo Pascal v7 DOS Educ	Borland	2
4	MS DOS v6.22 Upgrade	Microsoft	3
5	Turbo C++ v3.0	Borland	-
6	FSFX Upgde For MS Flight Sim	Microsoft	4
7	Macro Assem V6.11 Win/DOS	Microsoft	32
8	NetWare v5 Server	Novell	-
9	TAS Books Payroll	Megatech	-
10	IBM PC DPS v7	IBM	-

CD-ROMs

1	Star Wars: Behind The Magic	Lucas Arts	-
2	Hip Hop eJay	Fast Trak	-
3	Dogz 2	Mindscape	-
4	Catz 2	Mindscape	-
5	You Don't Know Jack	Take 2	-
6	Rave eJay	Fast Trak	2
7	Dance eJay	Fast Trak	1
8	Anastasia	Fox Interact.	-
9	Geoff Hamilton's 3D Gdn Des.	GSP	-
10	Lie Detector	United Inter.	-

Games

1	Cannon Fodder	Sold Out	2
2	FA Premier League Mgr 99	Gremlin	1
3	Rainbow Six	Take 2	5
4	Star Trek: Klingon Honour Grd	Micropose	-
5	Championship Mgr 2 97/98	Eidos	9
6	Caesar 3	Sierra	-
7	Age Of Empires	Microsoft	-
8	Theme Hospital: Classic	Bullfrog	10
9	Titanic: Adventure Out of Time	Europress	-
10	Dune 2000	Elect. Arts	7

Games and CD-ROM figures supplied by HMV. Others from Software Warehouse.

Axis and Allied forces clash on your desktop

▲ IN AXIS AND ALLIES, RUSSIAN FORCES ADVANCE INTO NORTHERN EUROPE, WITH THE HELP OF TANKS, INFANTRY AND THIN BLUE LINES

Hasbro Interactive is moving into strategy gaming. Its latest release, **Axis and Allies**, is a CD-ROM version of the classic WWII board game. Players enter the fray in 1942. As a world leader, you have the power to change the course of history as you wage a battle for supremacy and global domination. Plan strategic bombing raids, submarine attacks or a major invasion by land, sea and air, while protecting the economic status of your nation. Axis and Allies is out now, priced £39.99.

The latest release from Sierra has just hit the shops. **Viper Racing** is a driving simulation featuring one of America's fastest sports cars, the Dodge Viper. Players earn money during their driving "career" to upgrade their cars and can eventually drive the monstrous Viper GTS-R. By competing in more than 20 races, drivers work their way up through four different classes in the Viper Racing League, gradually earning more than 40 different Viper upgrades. Viper Racing costs £39.99.

Eidos Interactive is the producer of the new **Michael Owen's World League Soccer '99** game, and it looks set to be a hit among football lovers. The game features more than 190 teams from ten different leagues, covering major soccer territories worldwide. Owen's actual moves are incorporated, having been recorded by a motion-capture animation system, and commentary is provided by Peter Brackley and Ray Wilkins. Out in the shops now, it's priced at £39.99.

Continuing the Second World War theme, Microsoft is due to launch an addition to its Close Combat series. **Close Combat III: The Russian Front** puts you in command of either the Red Army or the Germans in the Eastern Front struggle of WWII. Players try to out-fight their opponent while keeping their troops alive. They begin as lowly commanders, managing unit upgrades and maintenance, and attempt to advance in rank and gain more troops and equipment. It will be available from the end of January.

ETELKA CLARK

Games featured in Screenplay (p306) this month: Lose Your Marbles, Reah, Lie Detector, Combat Flight Simulator, and Quake II and Age Of Empires expansion packs.

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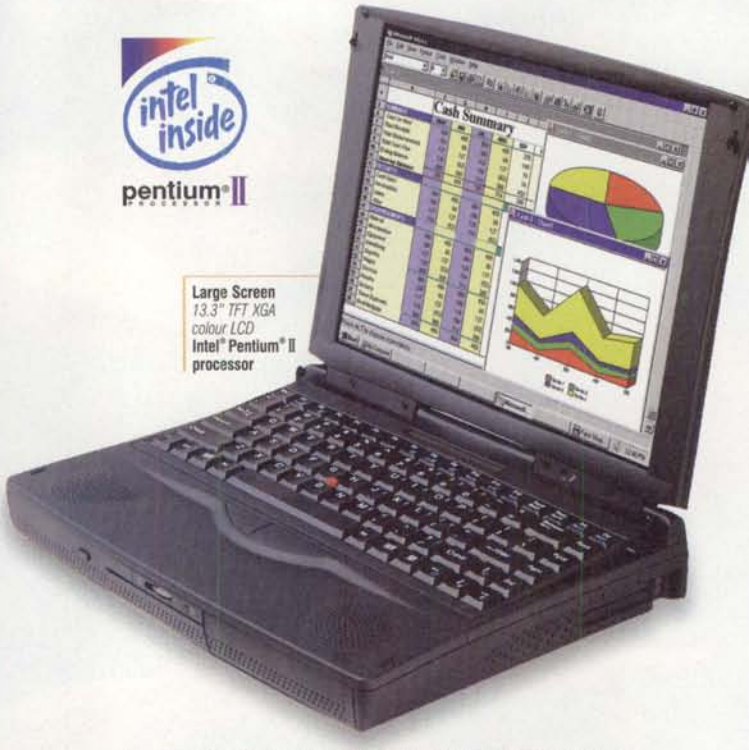

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Editors' Choice PC Magazine, March 1998

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In the Big Apple, Michael Hewitt finds keeping in touch from his hotel room as easy as pie.

Start spreading the news

A few years ago I wrote a book called *Travels with a Laptop*. A seminal work, its impact on portable computing was almost as great as that of *The Joy of Sex* on the semiconductor manufacturing industry. The trouble was, it came out just a couple of years too late. My *œuvre* described the problems involved – and there used to be many – in lugging a laptop around the world and hooking up its modem to foreign telephone systems. It was all about attaching acoustic couplers to handsets, modem transmission protocols, gratuitously vandalising your hotel's skirting boards in order to get at concealed phone wires, and all sorts of other horrible, technical stuff. Unfortunately for my royalty-cheque prospects, between writing the thing and its publication there was a quiet revolution: laptops suddenly went from being jokey executive fashion accessories into practical, workaday tools; comms software became idiot-proof; and hotel bedrooms worldwide started offering dedicated data ports, and more besides.

Take, for example, my room here at the Waldorf Astoria (he said, casually, in a doomed attempt to persuade the Inland Revenue that by writing about it in a computer magazine, it would become a tax-deductible business expenditure rather than just a holiday). There are so many data ports in the wall, it looks as if I've got a bad infestation of rather energetic termites. There's also a modem in case my computer hasn't got its own. If I haven't got a computer, I can ring down to room service and they'll have the latest Pentium Pro sent up to me. And as for finding an internet service provider, well, this is New York: if I want it, there's probably even a pastrami-flavoured one out there somewhere, with extra mayonnaise. But as it is, I've come prepared with an AOL account, which, with a couple of clicks, allows me to connect to a freephone 800 number, thereby avoiding silly hotel phone surcharges (and in this hotel they are *really* silly, believe me).

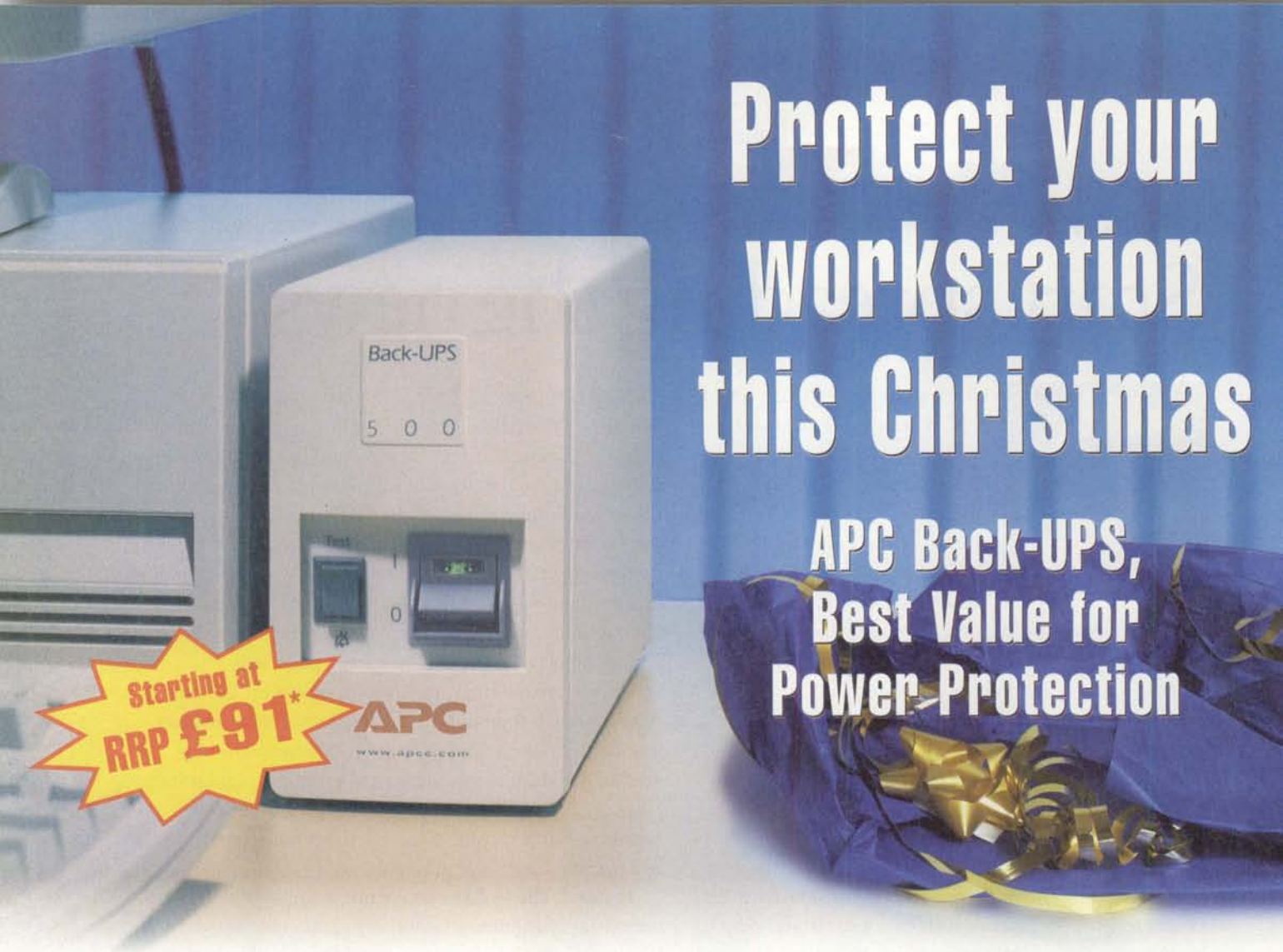
The point is, sending an email message back home – which, just two years ago, would probably have been a Herculean task – has become about as difficult as finding your own backside in the dark. (Less so actually, because in the case of errant backsides, there's no 24-hour helpline number you can call.) Indeed, sending a mere ASCII email message is nothing at all. I've been doing a lot more besides. This morning, for instance, following in the footsteps of King Kong, I went to the top of the Empire State Building. My visit, although somewhat less eventful than his, nevertheless gave me the opportunity to take lots of photographs with my digital camera. Likewise my visit to the Statue of Liberty later in the day. Back at the hotel, I transferred the pictures to my laptop, incorporated them into a web page, and uploaded it to the internet. Then I sent lots of "click on this" messages to friends and colleagues. *Et voilà*, instant, interactive, electronic postcards. And because the new version 4 of AOL allows the service to act as a regular ISP, I was also able to Telnet into CiX and get my Demon email via POP3. As well as the usual internet-type things, like finding a good bar in the vicinity.

Indeed, these days you're not simply limited to the terrestrial telephone network. My plane coming over, a Virgin Atlantic 747-E, was equipped with a Skyphone on every seat. Swipe a credit card through one of those, and courtesy of a geostationary Inmarsat satellite, you can talk to someone virtually anywhere on the planet while you're airborne. Skyphones in first class have RJ-11 data ports, allowing executives to plug in their laptops and go online. Mind you, at just 9600bps and a cost of $9 per minute, you probably wouldn't want to download too many Pamela Anderson .gifs. Then again, if you can afford first class, the price probably doesn't bother you unduly. Inevitably, though, rates will tumble and speeds will increase such that, very soon, we'll all be netsurfing at 40,000 feet.

So, a book about travelling abroad with a laptop now has all the "must have" and "couldn't put it down" appeal of one about, say, the trials and tribulations of buying an adapter plug for your electric shaver. Now, perhaps that's an idea I could put to Remington...

As for finding an internet service provider, well, this is New York: IF I WANT IT, THERE'S PROBABLY EVEN A PASTRAMI-FLAVOURED ONE SOMEWHERE, with extra mayonnaise

Mike.hewitt@mjh1.demon.co.uk



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Net fraud is on the up. Barry Fox wonders whether those in charge are doing enough about it.

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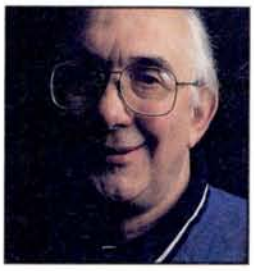

CompuServe's MD, Martin Turner, dismisses the launch of Dixons' Freeserve as "an irrelevance". He's backed up by his European boss, Konrad Hilbers. Says Turner: "We cannot see what impact Freeserve will have on CompuServe, except to encourage more people to join us for a better service. We're the first choice of the busy professional and discerning consumer. We're making a strategic bet that customers will continue to pay for the better service our infrastructure offers."

Whatever Turner and Hilbers may like to dream, Freeserve leaves me wondering why I pay CompuServe £6.50 a month for an email address, £2 an hour for extra time and why I'd even consider paying £18 a month for unlimited access. By offering free internet access in return for a personal mail order profile, Dixons has rewritten the rules of internet marketing. As the company's Chief Executive, John Clare, puts it, "shops don't charge customers an entrance fee." But be warned, Freeserve is not a panacea. It makes itself the default for IE4, ousting other ISPs like MSN. Users will then need skill or help to restore their original settings. And, as I know to my cost, once you have started to install Freeserve, it's already too late to quit. Although Freeserve offers ISDN dial-up, Clare's techies have still not made it work with the Ignition terminal adaptor that BT flogs to its ISDN and Highway subscribers – a clumsy omission. Yet, if nothing else, Freeserve is already encouraging others to cut the cost of access. CompuServe is re-launching next year with a new service, CompuServe 2000, and Konrad Hilbers admits it may be cheaper. Astonishingly, neither company provides access from Windows CE handhelds. More importantly, the system remains wide open to insidious abuse: so much has originated from Russia and Bulgaria that all access from those countries has been closed.

When new users sign up for their free month's trial period, they're quite legitimately asked for personal billing details and credit card number. Over the next few days they may receive a message which purports to come from CompuServe (e.g. Marion Miller, Accounts Manager) saying there are "problems with your account" and asking the subscriber to send an email form with all their billing details again. It's all very plausible, especially to someone new to email and the internet. But of course, there's no Marion Miller at CompuServe, and the details wing off to an unknown fraudster. Turner acknowledges "new users are bombarded with spam". He's aware of the scam, but says "there's nothing we can do to stop this; there are some pretty shrewd people out there, but it's fraud and our security group tries to track them down". Yet CompuServe cannot quote me a single case of prosecution. Turner says the fraudsters choose addresses at random. But this is unlikely, as new users are targetted. Parent AOL knows that fraudsters send scam requests for billing details, but they're received at random and not targetted at "green" users.

I checked one recent target and found their name was not in CompuServe's Member Directory. So, the fraudster didn't get the address that way. CompuServe uses a number-based subscriber system, with names only added as aliases. If fraudsters can detect the latest numbers issued to new subscribers, by signing up for a free month's trial, noting their own numbers and predicting the next batch, they can send scam emails to new subscribers. They can then close their account and use any received banking details to set up another one.

'...there are some pretty shrewd people out there, but IT'S FRAUD AND OUR SECURITY GROUP TRIES TO TRACK THEM DOWN'. Yet CompuServe cannot quote me a single case of prosecution

So if CompuServe is allocating new numbers in a predictable sequence, no wonder new members are being targetted even before they're listed. If number allocation is random, to hinder prediction, then the fraudsters must be hacking into CompuServe's database. In a clammy official statement, CompuServe states it "avoids providing addresses that can be easily identified". But this is a nonsense, because CompuServe provides a member's directory. It goes on to reassure me that "we employ strict security measures [and] take proactive steps to prevent spamming and misuse of the service". Well, that's all right then.

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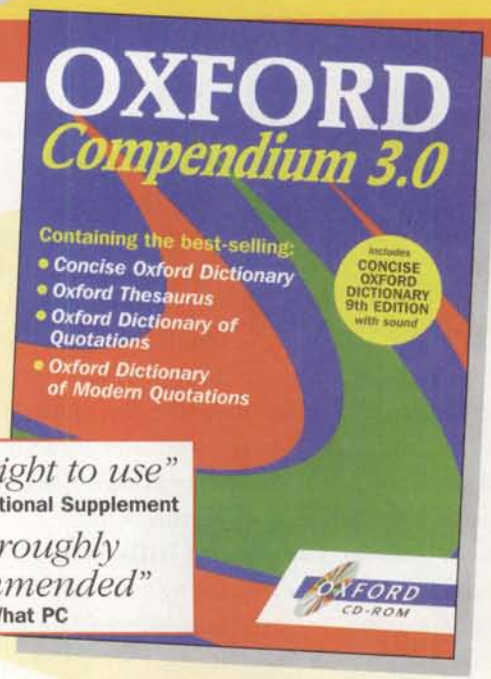

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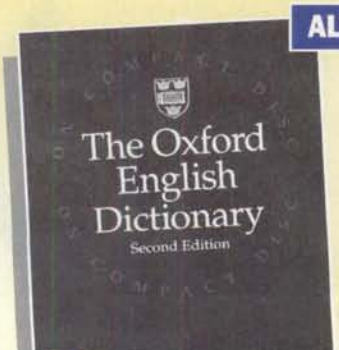

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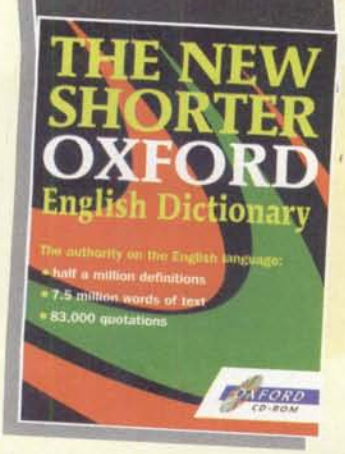

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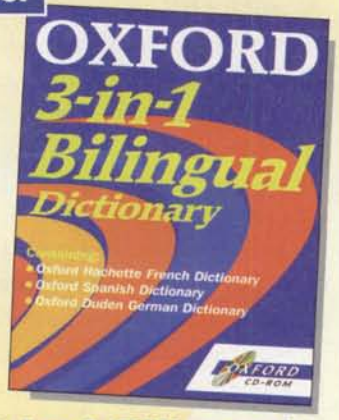

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Brian Clegg wonders whether our schools are placing the right emphasis on computer education.

Think of the children

It's knee-jerk time. Computers in schools? Great. It gets our young people ready for the real world. But is it a good thing? (For that matter, are schools there to get people ready for the real world? Anyway...) Let's travel back to the Stone Age. When I was a lad, computing didn't exist. Actually, that's not true; but it might as well have been, because there weren't any microcomputers and Littleborough County Primary School didn't run to a mainframe. Similarly, my illustrious grammar school hadn't even a calculator (it was, however, hot on slide rules). That's where I got my introduction to computing, though. We punched cards by hand, bundled them up, and posted them to a London university. A week later, a listing came back, showing a punching error in the second card. With luck, you could get a program running at least once a term.

This might have been extreme, but it was preparation for real life. Out in the business world there was quicker turnround, and you could punch your cards by machine (or have them produced by the punch room). Even so, the basics were the same. Now let's skip forward. As micros emerged, computers started to penetrate primary education. Now there was a conflict of interest. Should we opt for a school computer that was user-friendly, or one that prepared you for the real world? In the US, ease of use (and excellent marketing) won. While business equipped itself with IBM compatibles, American education chose the friendly face of the Mac. In the UK, thanks to politics and cost, we ended up with Acorn's BBC Micro – a typical British compromise that was neither relevant to business nor easy to use.

Before I get flooded with emails, I ought to qualify that. The BBC machine was sophisticated when compared with the home offerings of the time, and it came out a couple of years before the Mac. But it locked the early years of our educational system into a backwater from which it is only now escaping. When you see how five-year-olds can use a Windows PC, there's little argument for going any other way now, and PCs are at last taking over; but software remains an issue. Not software for teaching maths or spelling, but the software that introduces computing itself. Here, the traditional values of buying British and not worrying about the real world still hold sway.

I've recently been sent a package called ToonTalk, made by Logotron, a British software house specialising in software for education. ToonTalk is a programming language, letting youngsters learn the rudiments of controlling a computer using an on-screen construction set with the help of a friendly robot. ToonTalk is brilliant, and adequately covers modelling and control, two requirements of the curriculum. Admittedly, my junior-school teacher friend initially found it slow going, but her pupils are now getting on well. And ToonTalk is great, seen just as a modelling tool. But it's certainly not preparation for the world, since the vast majority of those children won't be programming computers.

So what's missing from computer education? How about starting with the basics of handling, like putting CDs in without getting fingerprints all over them. Then the ABC of Windows, understanding how to interact with the user interface to get things done. How to explore menus and help systems, all done in a jolly, fun and games fashion, of course. If we can ensure that our children's natural instinct to explore is used in the right way, they'll never need training in Word or Notes when they get older – it will come naturally. As for programming, if we must teach it, then why not use something as universal as Visual Basic? Those crafty UK educational software houses could build nice add-ins to make VB even easier, though even without it, eight-year-olds are capable of writing programs, are learning a lot about control, and are gaining a useful skill into the bargain. By the time they get to work, VB may not be in existence, but it's a better bet for the basis of future development environments than a construction kit.

Acorn's BBC was sophisticated when compared with the home offerings of the time, BUT IT LOCKED THE EARLY YEARS OF OUR EDUCATIONAL SYSTEM INTO A BACKWATER from which it is only now escaping

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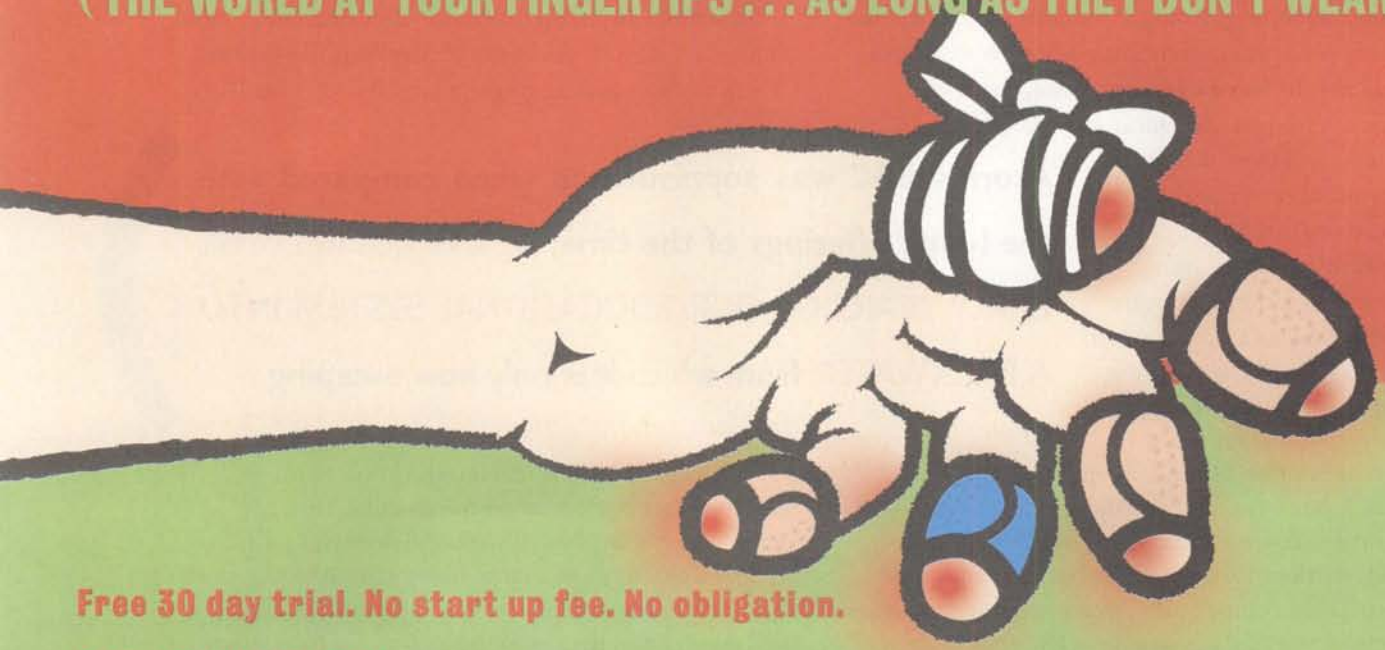

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Paul Smith mourns the passing of one of the seminal characters of internet development.

Your number's up

If you had to name one guru of the internet, who would it be? Marc Andreesen, the first person to corner the market in web browsers (and vowels)? Tim Berners-Lee, who invented the worldwide web? Or big, bad Billy G, who just owns the whole thing? Me, I would probably vote for Jon Postel, except that he has just excluded himself from the running by dying. Postel, who was 55, just looked the part, with his t-shirt, long straggly hair and wild, frizzy beard. Postel almost single-handedly invented and, until his death on 16th October from a heart attack, controlled the single most crucial element of the whole internet: the numbering system.

Someone once told me that, when you type in an address such as, oh, say, www.paulsmith.com, the internet has no direct way of knowing where that site resides. Instead, it is translated from a URL into a number of the form 123.456.789.012 by a directory naming service (DNS) server. Well, that naming system is what Postel started way back in the sixties. He also spent his spare time administering another important part of the internet, the "request for comments" (RFC) system of designing and amending net standards. Actually, that's not fair. The "Numbers Tsar" devoted his whole life to what has become the key technology of the decade. He also did it without much reward; while lesser people around him created fortunes out of nothing, Postel stuck to his hippie roots and foreswore excessive payments. His real spare time was spent outdoors, backpacking around Yosemite National Park in California.

Recently, Postel had been in the news a fair bit as the United States prepared to open the naming system to a more international body. Actually, Postel helped keep the system pretty much the way it was, but with a new name. One of the big problems is that there's much more demand for names than there are cool names left. The best ones are already taken. Obviously, www.paulsmith.com has gone. Someone else has got www.paulsmith.co.uk, www.lard.com, www.buttsville.com; even www.becausewecan.com has been taken. And there have been suggestions of new top-level domain names, such as .firm for firms' sites, .sex for sex sites and .dom for dom sites. These are, by and large, silly. So I propose a new set of root domain names. For example, .mine for sites that are mine. Obviously, there would also have to be a .yours, for your sites. I also think there should be a .pants, because there are so many sites that are, frankly, pants. Actually, we shouldn't have URLs at all. They're not uniform, most sites aren't that resourceful, and while they may help computers locate them, they sure don't help humans. I mean, who was it that thought adding "www." to the beginning and ".com" to the end of all these names was going to be helpful, anyway? It was probably that Postel bloke, who's got a lot to answer for, in my book.

Here's a warning. In a rare and exceptional lapse, I am about to provide you with some information that could actually be construed as useful. Regular readers of this column should avert their eyes... now. I've recently discovered a couple of Internet Explorer 4 tips I thought I'd pass on. Now, to pre-empt the standard "everyone knows that" response which all tips are, by law, required to generate from 25% of readers, let me just say that I didn't and it's my column, so there.

I propose a new set of root domain names. For example, .mine for sites that are mine. There should also be a .pants, BECAUSE THERE ARE SO MANY SITES THAT ARE, FRANKLY, PANTS

OK, Tip Number One. You know that if you just type in a single word in the address box, IE4 will search for the site with different prefixes and suffixes, right? Type in "buttsville" and it will search for "www.buttsville.com", then "www.buttsville.org" and so on. You can, however, change this order to include, for instance, "www.buttsville.co.uk", by opening the Registry and editing the HKEY_LOCAL_MACHINE\Software\Microsoft\Internet Explorer\Main\UrlTemplate thingy. Tip Number Two. If you're sure it's "www.something.com" site, just type in "something" and hit Ctrl+Enter. Cool, eh? Don't tell the people who shut their eyes. OK, everyone, you can look again. And I promise not to be useful again.

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LETTER OF THE MONTH

OLDER AND WISER OAPCs

I wish to comment on the article "Old PCs" (*PCW September 1998*) and hope I can persuade you to ask your staff to research and write also about "Old PC Users" like me: seniors, increasingly meaning anyone over 50. Throughout the world, as governments, health services and banks progressively reduce their human presence and go online, seniors who need to access these services, but are computer shy, become increasingly disadvantaged. At the very least, older people can easily become isolated and a burden for their family and society, whereas the world of email and newsgroups can open up new horizons for them — see www.seniornet.org among many others. On the other hand, computer-confident seniors with retirement funds and time on their hands can become a sizeable market for all manner of hardware and software (and computer magazines). 1999 is the United Nations International Year of Older People. So following up on your article, may I suggest a report along the lines of encouraging readers to pass on their old 386 to grandma and teach her how to write her memoirs. At this time of the year it will solve a Christmas-present problem and then all she needs is an internet connection for her birthday.

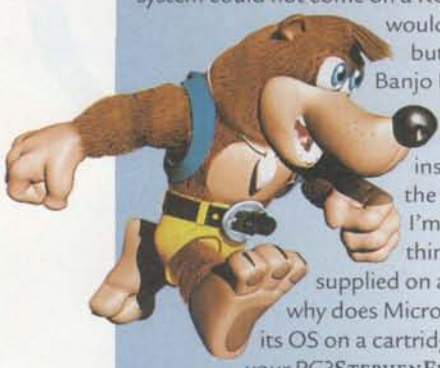
GRAHAM DEAN
deangr@pipeline.com.au

Gordon Laing replies >

Despite having January 1999 on the cover, this is effectively our Christmas issue and Graham's sentiments seem particularly appropriate. If only I could get my techno-shy parents online: you'd have thought the years of buying me a variety of British home computers as I grew up would have cured their aversion to PCs! While I try to persuade them over the turkey and stuffing to change their minds, we hope you enjoy using your new Taxan 17in monitor. Merry Christmas!

BITS AND PCs

I totally agree with John Newbury (*Letters, PCW December 1998*). I don't see why an operating system could not come on a ROM chip. You say it would be too expensive, but my Nintendo 64 Banjo Kazooie cartridge holds 128Mb of data and it loads instantly when I hit the power button, and I'm not certain, but I think the Zelda64 is supplied on a 256Mb cart. So why does Microsoft not just deliver its OS on a cartridge that slips in to your PC?STEPHENFUSI
stephen@fusil.force9.net



PCW replies >

'Fraid not, Stephen. The console industry talks of bits, not bytes, so your 128-megabit game is in fact only 16 megabytes in size. Secondly, as mentioned in last month's Letters, operating systems such as Windows 98 require fairly sophisticated virtual memory managers which often tie up large amounts of hard-disk space at a time. The closest you're going to get to Windows on a ROM is CE in a handheld.

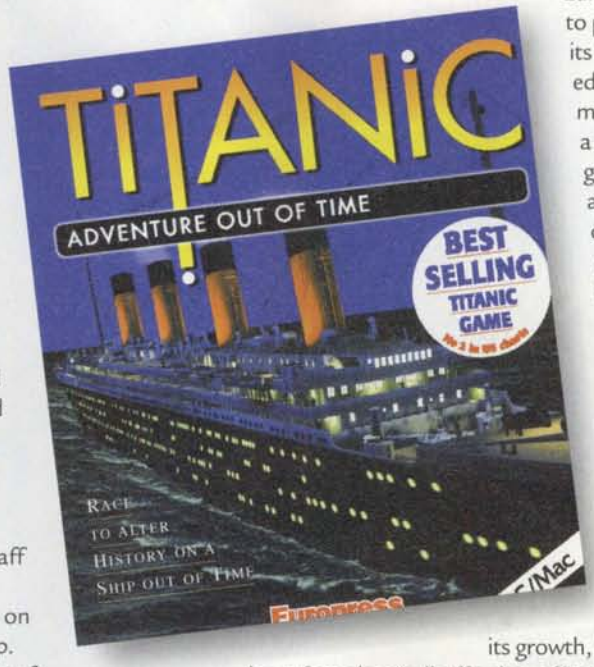
SMALL BUT PERFECTLY FORMED

With regard to December's Star Letter about encouraging young programmers: shipping "Windows BASIC" with PCs might be a start, but there is one further barrier between children and programming. If you've ever watched a five-year-old trying to play any kind of PC game, let alone program, the first thing you notice is that they are just too small to handle the mouse or keyboard properly. Perhaps one reason that so many children hacked away at their Spectrums and ZX81s was that the membrane keyboards, hateful for adults, were just the right size, and with the keywords you didn't even need to type that much anyway. Perhaps the programming language built in to the Psion and other palmtops with tiny keyboards will be where the next generation of code gurus cut their teeth.

BEN CURTHOYS bcurthoys@artifaxsoftware.com

EUROPRESS LEISURE NOT SUNK WITH TITANIC

In the Newsprint section of your December issue, you incorrectly reported that "there'll be no more games from Europress". In February, Europress will launch Rally Championship '99. It simulates the Mobil British Rally Championship and includes a wealth of new features including photo-realistic tracks modelled on real-life environments, unique new object realism and texture animation, multiple track options and virtually limitless multi-route environments. Secondly, you stated that Titanic - Adventure Out Of Time and Championship Rally "had disastrous effects on the company's profit margins", which led to it axing a third of its staff and pulling out of the games market. Wrong again! Our Rally brand has topped the charts on four continents with RAC Rally Championship. Titanic - Adventure Out Of Time is, at the time of writing, at number three in the ChartTrack best-seller charts and also achieved the number one position in the PC Data charts. Far from losing money, it has been – and still is – an outstanding financial success.



Europress recently decided to place more emphasis on its leadership in the education and lifestyle markets which did lead to a reduction in staff on the games front, but this was a strategic change of direction and certainly not because of losses from such blockbusting successes as Titanic. Although the emphasis has changed, there is no doubt that we will still produce good-quality entertainment products. Europress has been investigating a financial investment package to further accelerate its growth, but it has certainly not been forced to "sell off a slice of its equity" because of losses on Titanic and Championship Rally. I hope this makes Europress' situation clear.

DON LEWIS, MARKETING DIRECTOR, EUROPRESS
donl@europress.co.uk

RETRO RESOLUTION

Simon Collins (*Retro, PCW October 1998*) states that the Commodore VIC-20 was capable of 300x200 colour graphics, multiple sprite levels and had a MIDI interface. Although the Commodores were indeed good platforms (and I should know, I still run two VIC-20s), the most I have ever squeezed out of a VIC's resolution is 128x224, and achieving four colours simultaneously reduces the horizontal resolution by half. The later models had sprite capability, but the VIC certainly does not. The C64 may have had the resolution stated, having more columns. However, as far as I know, none of the models have ever supported MIDI. Certainly the VIC-20, C16 and C64 models did not, because I had to make my own interface for the VIC-20s. The Amiga, too, requires a hardware adaptor in order to be MIDI compatible.

DL BORRELL templarser@aol.com

FINN-ISHED PRODUCT

In a *PCW* October news piece about the Linux operating system you reported that the creator of Linux is a Danish youngster named Linus Thorvald. In fact he is, and has always been, a citizen of Finland, and created the core of Linux while studying at the University of Helsinki in the early 1990s. After graduating he moved to California to work for a new high-tech company there. You must have received many corrections about this one, but I felt my duty as a Finn to make this absolutely clear.

JAAKKO WALLENIUS jaako.wallenius@pp.inet.fi

PCW replies > *You're absolutely right, Jaakko, and as some sort of compensation, please find part one of a new three-part Linux Workshop in our Hands On section, starting on page 242.*

GIANT OF A MACHINE

Can you explain why Colossus, lurking around at Bletchley Park, which uses valves and GPO mechanical relays as switches, which has no memory, and which feeds data in via punched paper tape, can decrypt Enigma code, at the very least, ten times faster than a Pentium 75? There was an article in *New Scientist* on the subject some months back, where they also concluded that Colossus was the first parallel-processing computer, beating everyone else to the post by a whopping 50 years. Any comments? Or, even better, when Colossus gets up and running, could you do one of your comparison tests? Now that would make interesting reading!

SAM CHAPMAN
samuel.chapman@cableol.co.uk

Clive Akass replies > *The so-called "bombes", which were mechanical predecessors to Colossus, could also beat a Pentium, according to the current Bletchley director. Both the mechanical and electronic computers worked as fast as they did because they were designed for a particular task, as opposed to a Pentium which is a general-purpose computer. Their logic was hard-wired and would these days be integrated onto a custom chip, doing their task considerably faster.*

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In last month's PCW we went undercover, buying PCs from ten different manufacturers. This gave us an excellent opportunity to test not only the PCs themselves but also the sales and technical support services offered by the companies — in other words, the service you, the buyer, might well receive from these firms. This month, we give those same ten companies the right to reply, as they voice their opinions of our findings. Here is what they have to say.

FROM: ARMARI

Armari has traditionally specialised in building high-end, custom workstations for the professional, creative and development market. Hence our customer base has primarily been the more experienced PC user, which is why our systems may lack the more basic setup documentation. Our machines are shipped in a "plug in and go" state, and our help-desk engineers are happy to assist first-time PC owners through the basics. However, *PCW*'s undercover buying review provides us with excellent feedback of how we can improve our products and services. We are working on an easy-to-follow setup guide to assist first-time or less experienced users, which will be ready in time for December's Christmas buyers.

DAN GOLDSMITH, TECHNICAL DIRECTOR
ARMARI LTD

FROM: EVESHAM MICROS

Just as Evesham Micros takes feedback from its customers very seriously, it is good to see that a respected magazine is making such an effort to ensure that its readers have an accurate picture of the companies to which they entrust their hard-earned money. Your review has given us the opportunity to publicly congratulate our Technical Support team on their excellent performance, even under difficult circumstances. Given that Evesham was in the minority in offering an on-site visit by an engineer, we think your piece has strengthened Evesham's position as a company that offers more than just well-priced equipment. The products are supported by people who care about their customers and their needs. We were only sorry that you didn't highlight the two-year free on-site warranty and the fact that the technical support advice is a free-call number. We were a little concerned that it took so long to actually sell you a PC, but given that the entire company of 250 staff had just moved into our new headquarters over one weekend, we weren't entirely surprised! We look forward to taking part in next year's test.

CAROLYN WORTH, PR
EVESHAM MICROS

FROM: DABS DIRECT

I was pleased to see that you found the Dabs PC an "affordable, impressive office machine" at a "very reasonable price". We have recently invested over £2m in a new call centre for our Telesales and Technical Support departments and it was especially encouraging to see your positive comments with regards to our technical staff. Our sales staff are fully trained on an ongoing basis in both product and customer-service awareness. Your comments that "This new assistant...advised us on a number of sensible upgrades such as a BX rather than the LX chipset..." is in line with Dabs' policy of always trying, where possible, to future-proof our PCs rather than to sell the highest-possible-priced PC with today's technology. Dabs Direct plc is fully committed to offering our customers the highest levels of service and value available in the direct channel, and thank you for offering this chance to show this to our customers.

JONATHAN WALL, SALES MANAGER
DABS DIRECT PLC

FROM: DELL

We were delighted to win the Highly Commended award for both PC System and for our Technical Support. It was great to see our excellent support staff receive recognition for their hard work. While the test is based on a one-off experience, we believe that is an important independent benchmark and indicative of the quality of our customers' general day-to-day experience with Dell.

There are a number of issues, raised in your article, which I would like to clarify. We believe that a 17in monitor is now an entry-level display. We offer this at the same price which many of our competitors charge for a 15in display. In the unlikely event that a customer wishes to opt for a 15in, the cost saving is £35 and not £17 as stated in your article. The configuration your caller selected was a business bundle. Speakers were not included as standard but could have been purchased as an upgrade option.

Since the test was conducted we have introduced a standard three-year service offering on Dell Dimension systems. We remain focused on our customers and will continue to drive initiatives and programmes to further enhance their experience of doing business with Dell.

ANNETTE CONDON, PRODUCT PR MANAGER
DELL UK AND IRELAND

FROM: GATEWAY

Gateway is delighted to have been awarded your Editor's Choice for Best Sales Service in the *PCW* undercover-buying group test. As a company that listens to our clients and fits technology to their individual needs, it is important that our sales staff offer a high standard of service and technical advice. The *PCW* undercover group test was conducted on a very busy day for us, when President Clinton and Bertie Ahern were signing an e-commerce agreement at Gateway, and we are thrilled that our high standard of service remained consistent. Since the survey was conducted, Gateway has made significant changes to our Technical Support department. These include the introduction of "Virtual Queuing" (computerised call-back) and a review of the number of people allowed to join our conference lines.

JOHN SHEPHERD, HEAD OF SALES
GATEWAY EMEA

...right to reply

FROM: HI-GRADE

We were very pleased to receive the *PCW* Highly Commended award for sales service. At Hi-Grade, good sales technique is not about pushing the most expensive products to every customer, but recommending a system which suits each person's requirements to ensure that every customer is completely satisfied from the outset.

The comments in the Technical Support section were music to my ears, all calls "answered within a minute", with the problems quickly identified and solved over the phone.

ORI YIASSOUMIS , JOINT MANAGING DIRECTOR
HI-GRADE

FROM: TINY COMPUTERS

Tiny specialises in providing complete value-for-money solutions for home users and we are proud of the high level of service we provide to our customers. Tiny operates one of the largest helpdesk call centres in Europe with over150 staff taking 2,000 calls per day. The vast majority are solved on the first call, with average call-waiting time under four minutes. All helpdesk staff receive five weeks of technical training on all aspects of hardware, software and peripherals with ongoing training provided.

The treatment *PCW* received is not typical of that provided to most Tiny customers.

In answer to the specifics raised in your article: the upgradeability you required was not made clear to the sales person who specified the EX motherboard; had you stated you required memory on one DIMM, that is what you would have received. The Epson printer was obviously surplus to requirements but this was not made clear to the sales person, who would have increased the specification to a higher model (thus solving the motherboard expansion issues). The call waiting times were significantly better than those of several competitors (although adrift from our averages of thousands of recent calls) but no account was taken of this. The invented printer problem was solved immediately but little importance was placed on this. The testing of Tiny's helpdesk was inaccurate and statistically invalid. How can two calls fairly represent the ability of the staff? Improvements to our call centre is an ongoing procedure, some of which include more staff, better training, more phone lines, and specialist teams to deal with specific areas (monitor, printers, cameras, etc).

To summarise with "Bad points – everything else" shows extremely poor understanding of Tiny systems: how can the Intel processor, Microsoft Intellimouse, hotkey keyboard and Fujitsu hard disk be bad? This is a very damaging statement and gives inaccurate information to your readers.

JIM BUCHANAN, PR MANAGER
TINY COMPUTERS

FROM: MESH

We were disappointed by the outcome of the undercover PCs group test, given our strong recent performance in surveys by other publications. Given the potluck nature of this undercover survey, based on only a few calls, freak occurrences cannot be ruled out. In the equivalent survey last year, our sales team was ranked equal best and our product won a Highly Commended award. We have invested in improving standards of service across sales and after-sales support. We treat customer service as a priority and constantly monitor our standards. We send out customer satisfaction surveys with all the machines we ship. Of the many thousand responses, here are a few results. "*At MESH we pride ourselves on producing award-winning computers which offer the latest technology, superb value for money and excellent quality*"; 94 percent agreed we had done well or superbly. "*We expect our sales team to be friendly, helpful and knowledgeable, assisting you in choosing the right computer for your needs*"; 86 percent agreed we had done well or superbly. In addition, 88 percent said they would buy a PC from MESH again. We can only speculate as to why some of our competitors who regularly perform well in service and reliability surveys chose not to agree to take part in this survey. We will continue to make efforts to ensure that we deliver a consistently high standard of customer service. All our systems now come with a five-year warranty package, and our technical support team operates on a call-back basis offering the most cost effective service from our customers' perspective.

PAUL KINSLER, GENERAL MANAGER
MESH COMPUTERS PLC

FROM: NEC DIRECT

Our philosophy is to provide a build-to-order service which offers small- to-medium-sized businesses price/performance benefits. When a call is made to us, we establish the business requirements and then supply the right configuration. If a basic office machine is required then we will not recommend a high-spec machine with huge amounts of memory. If there is no need for a modem, we will not offer one as standard.

NEC Direct's technical support is designed for the business user, so we offer next working day, on-site technical assistance as standard. We do not spend hours on the phone going through possible scenarios when a visit from an engineer usually sorts the problem out in minutes.

COLWYN MUNRO, GENERAL MANAGER
NEC DIRECT

FROM: PANRIX

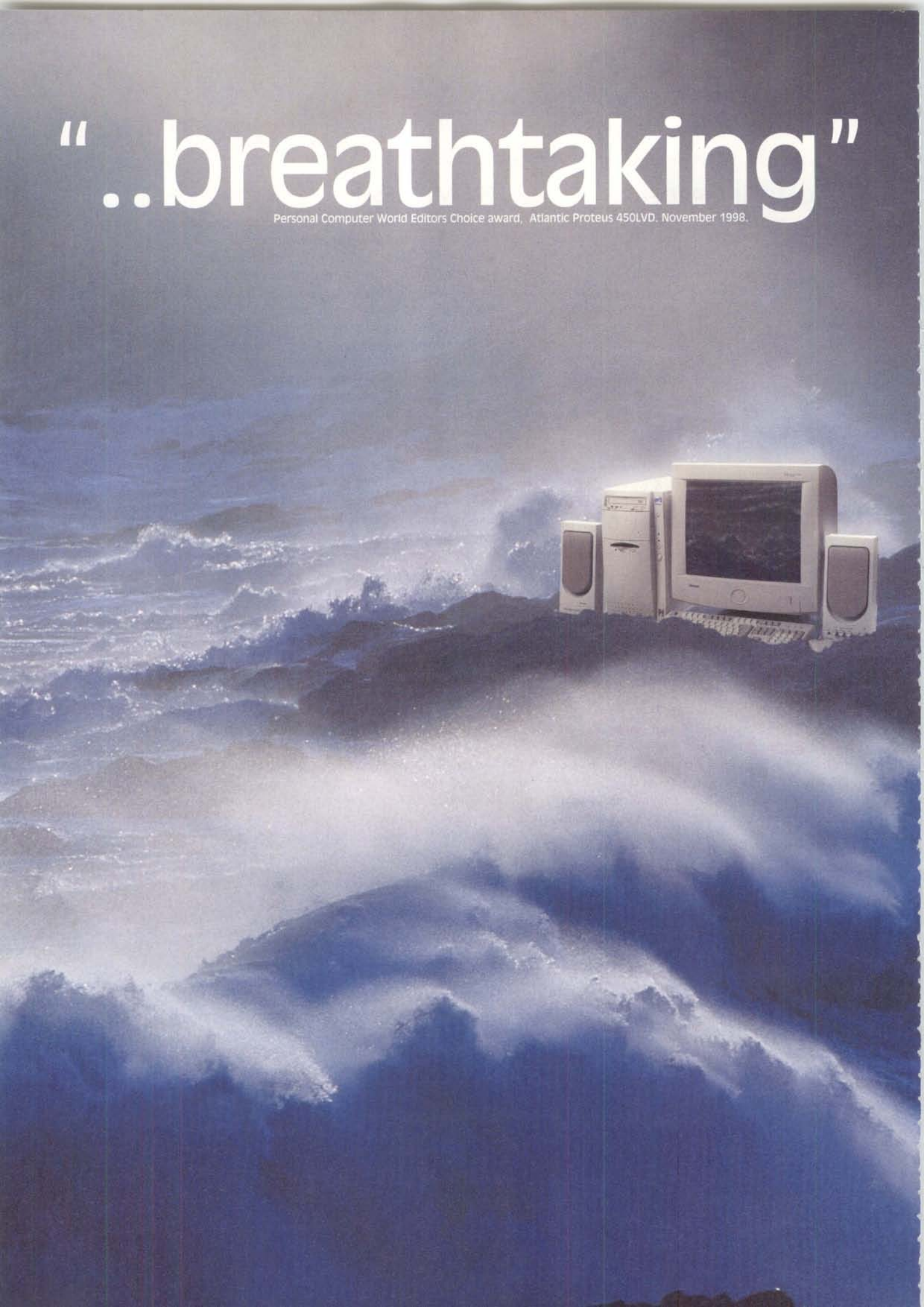
Firstly, we congratulate *PCW* on the effective way it conducted this group review. It is of great worth for the likes of Panrix, to enable us to identify our shortfalls. Since the article, BT has resolved the problems with our newly installed ISDN/call distribution phone system implemented to serve our recent move to larger premises.

Panrix strives to offer the best in the areas of performance, service and reliability. It was therefore very pleasing to be judged "Editors Choice". But rest assured, Panrix is always looking to improve on our very solid position. We will continue to work harder in the service areas to further compliment the positive aspects of Panrix, thereby further assuring your readers to buy with confidence.

SIMON PANESAR, SALES DIRECTOR
PANRIX

"..breathtaking"

Personal Computer World Editors Choice award, Atlantic Proteus 450LVD. November 1998.



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- Intel Celeron™ Processor 333MHz
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- 128k cache
- 64Mb SDRAM, expandable to 256Mb
- 4.3Gb Ultra DMA hard drive
- ATI® 4Mb 3D AGP graphics engine
- 15" 0.28 SVGA colour monitor
- 32Max CD-ROM drive
- Plug'n'play GM wavetable sound
- 160 Watt (PMPO) stereo speakers
- 56K voice fax & data modem
- Colour Inkjet Printer
- A4 Flatbed Scanner

intel inside celeron™ PROCESSOR

- Software
- Microsoft Windows® 98*,
- Lotus Smartsuite Including:
- WordPro,Organiser,1-2-3, Approach, Freelance Graphics.
- Corel Draw Suite 7 Select Edition Inc: Draw 7, Photopaint 7, OCR-Trace, Kodak Digital Colour Management, Corel Scan, 50 Clipart & 50 Fonts.
- IBM Worldbook Encyclopedia 98
- IBM Viavoice 98 continuous dictation software
- IBM Antivirus 3
- 30 day free unlimited internet access account.

£699 EX VAT **(£843.65** INC VAT & DEL **)**

Personal Computer World magazine describes the Atlantic Proteus PC as a 'breathtaking system' and 'the best of a very fine bunch' when awarding Editor's Choice award to Atlantic in the Nov' 98 'High End PC' group test.

There's never been a better time to buy a new Atlantic PC with our entire desktop range updated with more power features for your money than ever before and DVD drives now standard in many models. Support options extend up to five years parts and labour giving total peace of mind.

In summing up PCW Magazine said "...The Atlantic Proteus 450LVD is a well specced machine with every PC gadget you could hope for..." So turn the page now to find the new Atlantic system that's built to take **your** breath away...

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PANACOM

Atlantic Panacom notebooks are popular with users who need high performance multi-media PCs which are both powerful and portable. Sharp TFT colour screens, ergonomic design and exceptional build quality all weigh in under 3Kg. Mobile Pentium II Processors assure better performance and increased battery life when compared with other notebooks.

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- Intel mobile Pentium® II Processor 233MHz
- 12.1" TFT Colour Display
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- Neomagic 128bit 2Mb graphics engine
- Removable 24 Speed CD-ROM Drive
- 3.5" 1.44Mb disk drive
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- Li-Ion 'Smart' extended life battery
- 85 Key Integral Windows® Keyboard
- 2 PCMCIA type II or type III slots
- Zoomed video support
- Infrared IrDA 1.1 communication port
- Weight 2.9Kg • Dims:299 x 226 x 51
- SOFTWARE BUNDLE ONE

		Inc VAT & Del	Per Month
Panacom 233	**£1149**	£1372.40	**£43.82***
Panacom 266	**£1399**	£1666.15	**£53.20***

Spec as Panacom 233 with Intel Pentium® II processor 266MHz, 13.3" XGA screen and 3.2Gb hard drive.

Panacom 300	**£1849**	£2194.90	**£70.09***

Spec as Panacom 266 with Intel Pentium® II processor 300MHz, 64Mb SDRAM, 14.1" XGA screen, 4Mb AGP graphics & DVD drive.

AXIS 300i

The Axis is a good choice for the PC buyer looking for performance multimedia without the price. The Axis finally makes a top quality Internet multimedia PC affordable, providing a generous balance of features to suit home and business users alike. Business users may order the Axis with PCI network card installed - the perfect Windows PC for workgroup environments.

£499

- Intel Celeron™ Processor 300MHz
- Intel® 440EX AGP set
- 32Mb SDRAM, expandable to 256Mb
- 4.3Gb Ultra DMA hard drive
- ATI® 4Mb 3D AGP graphics engine
- 14" 0.28 SVGA colour monitor
- 32Max CD-ROM drive
- Plug'n'play GM wavetable sound
- 160 Watt (PMPO) stereo speakers
- 56K voice fax & data modem

- Microsoft Windows 98

		Inc VAT & Del	Per Month
Axis 300i	**£499**	£608.65	**£19.44***
Axis 333s	**£599**	£726.15	**£23.19***

Spec as Axis 300i with Intel Celeron™ Processor 333MHz, 128k Cache, 64Mb SDRAM, 15"SVGA Monitor & Software Bundle 1.

Axis 333PS	**£699**	£843.65	**£26.94***

Spec as Axis 333s with Colour Inkjet Printer and A4 Flatbed Scanner.

EPRO 333

Atlantics Epro system offers an array of high-end features with processor speeds up to 400MHz, DVD-ROM, 64Mb high performance SDRAM and 8Mb AGP graphics combine to make the Epro a formidable system for office and home multimedia use.

£749

- Intel Celeron™ Processor 333MHz
- 128k cache
- Intel® 440BX AGP set
- 64Mb SDRAM, expandable to 256Mb
- 6.4Gb Ultra DMA hard drive
- ATI® Xpert 98™ 8Mb 3D AGP graphics card with DVD-video decoding
- 15" 0.28 SVGA colour monitor
- DVD-ROM x5 drive (32x CD-ROM)
- PCI 64 voice wavetable sound
- 200 Watt (PMPO) stereo speakers
- 56k voice fax & data modem

- Microsoft Windows 98
- SOFTWARE BUNDLE ONE

		Inc VAT & Del	Per Month
Epro 333	**£749**	£902.40	**£28.82***
Epro 350	**£849**	£1019.90	**£32.57***

Spec as Epro 333 with Intel Pentium® II Processor 350MHz, 17" SVGA Monitor.

Epro 400	**£949**	£1137.40	**£36.32***

Spec as Epro 350 with Intel Pentium II Processor 400MHz, 8.4Gb Ultra DMA hard drive.

*Monthly payments illustrated are over 36 Months 17.9%APR. 10% deposit required. Other finance options with 0% Buy Now-Pay June 1999 available. Just 10% deposit required, with nothing more to pay for six months, then just pay the outstanding balance, price paid=normal cash price. Further

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"...breathtaking"

Personal Computer World Editors Choice award, Atlantic Proteus 450LVD. November 1998.

NEXUS 350

The Nexus range is based on a coupling of powerful 100MHz Pentium II processor system architecture and generous 128Mb RAM for truly outstanding performance. Nexus systems come equipped with full DVD capability to access the vast amount of CD and exciting DVD based software now available, and is enhanced by superior graphics and audio specifications as standard.

£949

- Intel Pentium® II Processor 350MHz
- 512k internal cache
- Intel® 440BX AGP set
- 128Mb SDRAM, expandable to 768Mb
- 8.4Gb Ultra DMA hard drive
- ATI® Xpert 98™ 8Mb 3D AGP graphics card with DVD-video decoding
- 17" 0.28 SVGA colour monitor
- DVD-ROM x5 drive (32x CD-ROM)
- Aureal® A3D™ PCI 64 voice wavetable sound
- LS-120Mb Superdisk™ drive
- 300 Watt (PMPO) stereo speakers
- 56k voice fax & data modem

- Microsoft Windows 98
- SOFTWARE BUNDLE ONE&TWO

PROTEUS 400

The Proteus offers a high-end feature set to users running the latest multimedia and Internet application software.
Utilising Pentium II processors, 128Mb system RAM and third generation DVD-ROM drive, the Proteus represents superior performance and future proofing which will satisfy the most demanding PC power user.

£1199

- Intel Pentium® II Processor 400MHz
- 512k internal cache
- Intel® 440BX AGP set
- 128Mb SDRAM, expandable to 768Mb
- 13.6Gb Ultra DMA hard drive
- Matrox MGA G200 16MB AGP graphics card with DVD video decoding
- 17" 0.28 SVGA colour monitor
- DVD-ROM x5 drive (32x CD-ROM)
- Aureal® A3D™ PCI 64 voice wavetable sound
- LS-120Mb Superdisk™ drive
- 300 Watt (PMPO) stereo speakers
- 56k voice fax & data modem

- Microsoft Windows 98
- SOFTWARE BUNDLE ONE&TWO

SOFTWARE

Bundle One

Microsoft Windows® 98*,
Lotus Smartsuite including:
WordPro,Organiser,1-2-3, Approach, Freelance Graphics.
Corel Draw Suite 7 Select Edition Inc: Draw 7, Photopaint 7, OCR-Trace, Kodak Digital Colour Management, Corel Scan, 50 Clipart & 50 Fonts.
IBM Worldbook Encyclopedia 98, IBM Viavoice 98 continuous dictation software, IBM Antivirus 3.
30 day free unlimited internet access account.

Bundle Two

as Bundle One plus:
AGP enhanced software bundle: Red Line Racer, G-Police, JazzJackrabbit 2, Tonic Trouble, O-Zone, Beyond the Third Dimension, F22 Air Dominance Fighter.

Warranty

Atlantic PC systems are covered by a no quibble 14 day money back guarantee ensuring your total satisfaction. Your statutory rights remain unaffected. Atlantic PC systems come with full parts and labour warranty for the first year. After that you receive free labour for the lifetime of the system for installation of any upgrades or add-ons you purchase from Atlantic.

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All systems feature 105 Key Windows Enhanced Keyboard, High Resolution 400dpi Mouse*, 3.5" 1.44Mb Disk Drive and Full USB Support on all models.
*Notebook systems feature integrated keyboard & touchpad

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Nexus 400	£1099	£1313.65	£41.95*
Nexus 450	£1199	£1431.15	£45.70*

Spec as Nexus 350 with Intel Pentium® II Processor 400MHz

Spec as Nexus 400 with Intel Pentium® II Processor 450MHz & Matrox MGA G200 16Mb graphics.

		Inc VAT & Del	Per Month
Proteus 400	£1199	£1431.15	£45.70*
Proteus 450R	£1599	£1901.15	£60.71*
Proteus 450LVD	£1999	£2371.15	£75.72*

Spec as Proteus 400 with Intel Pentium® II Processor 450MHz, HP 8100i CD rewriter &19" 0.26 SVGA colour monitor.

Spec as Proteus 450R but with Seagate Cheetah 9.1Gb SCSI LVD hard drive (80Mb/sec) & Adaptec 2940U2W controller and SCSI CD rewriter.

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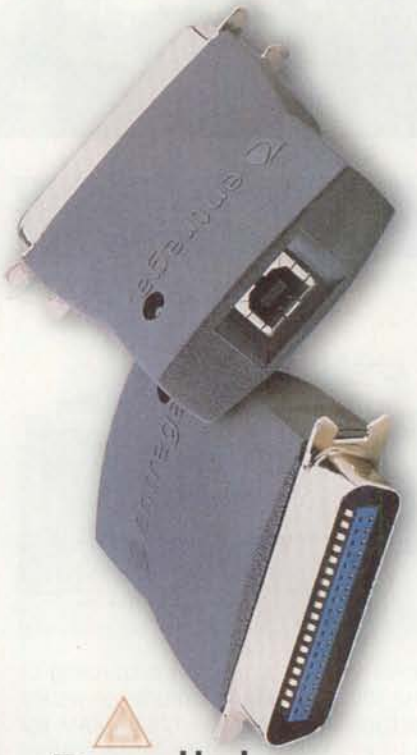
gadgets

compiled by David Fearon

'Houston, we have a problem'

Those of you who've been watching the live webcasts of the latest Shuttle mission could buy Talking Technologies' Talkmic and pretend you're sitting at a console in mission control. People with lives and friends and families may wish to buy it for its intended purpose, which is as a superior replacement for the microphones bundled with voice recognition packages.

Price £46 (£39 ex VAT)
Contact Talking Technologies 0171 602 4107

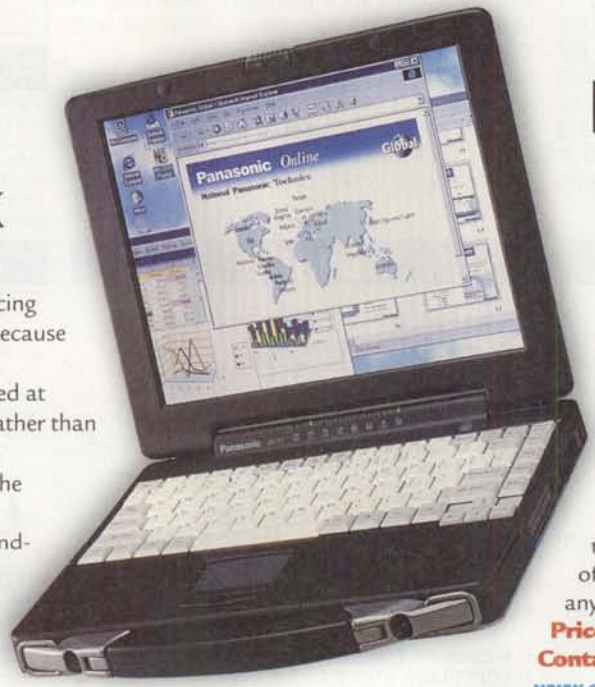


Parallel universe

No, it doesn't look awfully sexy, but it does a rather groovy thing: Entrega's P36 adaptor turns your printer into a USB device, which means, theoretically, you can connect a whole heap of printers to your machine. If you don't happen to have a whole heap of printers, you could buy one anyway, just to do something with those USB ports sitting at the back of your PC which you've never had anything to plug into.

Price Around £41 (£35 ex VAT)
Contact Entrega 0118 951 9549
www.entrega.com

I wanted to be a lumberjack



Those people at Panasonic are positively obsessed with producing ruggedised notebooks. Why? Because they sell lots. Unlike the Husky, Panasonic's ToughBook is aimed at businesspeople on the move, rather than archaeologists tramping about in muddy fields. The CF-71 is the prettiest yet, jumping on the magnesium-alloy-clad-top band-wagon, calculated to make any self-respecting male executive drool.

Price £2,700 (£2,299 ex VAT)
Contact Panasonic 0990 357357 www.panasonic.com

Is it a bird?

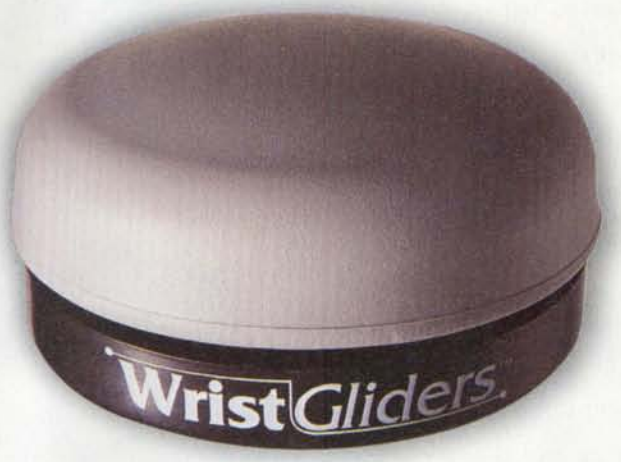
Just the thing to complement and enhance the natural, dull-beige tone of your PC: Fuseon's MouseRugs are based on authentic Persian and far-eastern designs, apparently. The one you see here is the Maroon Bokhara, if you hadn't already recognised it. Fuseon claims that the MouseRug material has all sorts of wonderful properties, including dissipating static, keeping your mouse clean and hovering five inches above the ground, thereby facilitating its use as a rudimentary magic carpet... Only joking.

Price £12.95 (£11 ex VAT)
Contact Fuseon Graphics 01376 500566

It's all in the wrist

No, they're not luxury air hockey pucks, they're an ingenious way to relieve fatigue and help prevent RSI. Wrist Gliders are designed to sit under your wrist and support your hand while you're typing or mousing. An interesting concept, but we found them a bit weird as we had to carefully position them and then slide our wrist around in a strange fashion to keep them there. Still, they're a talking point.

Contact **POW Distribution 01202 716726 www.wristgliders.com**
Price **Single £6.95, pair £12 (£5.90 & £10.20 ex VAT)**



Silicon heaven

SGI's lovely LCD flatpanel doesn't just look lovely, it's the only commercially available panel we know of that will run at a higher resolution than 1280 x1024. Due to its wide aspect, with 17.3in diagonal, the 1600SW will handle 1600x1024. It's got a digital interface (which at the moment you can use only with SGI workstations) and, unusually for a flat-panel, adjustable colour temperature. Strangely enough, it's also rather expensive.

Price **£2,127 (£1,810 ex VAT)**
Contact **Silicon Graphics 0118 925 7500 www.sgi.com**

Colour me blind

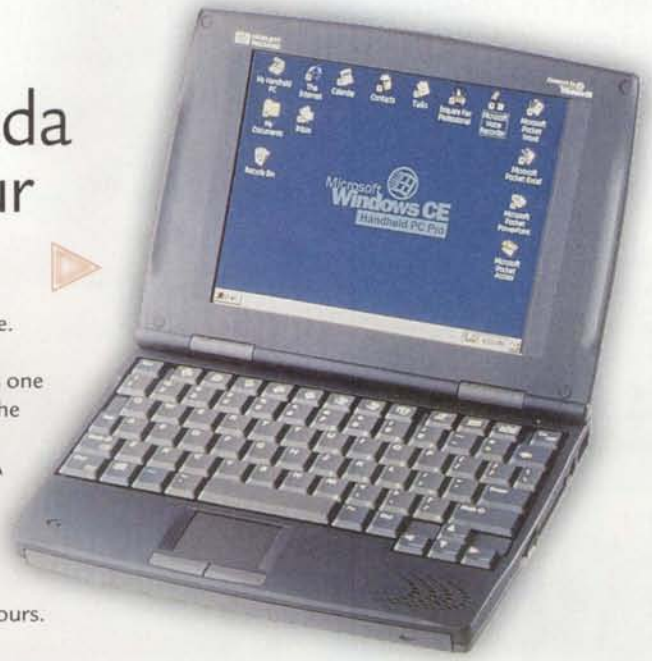
The good-old GameBoy has been around for ten years now. Yes, it's true. In that time there have been lots of coloured cases, but the screens have never displayed so much as a hint of purple or a dash of red. But now – Hurrah! – there's the Color GameBoy. It'll display 32,000 colours, it's the same size as a GameBoy Pocket and it runs all your old games, too. Battery life is a tad reduced, but Nintendo claims up to ten hours.

Price **£69.99 (£60 ex VAT)**
Contact **Nintendo 01703 653377 www.nintendo.com**

A Jornada for your journey

Here's an interesting beastie. HP's Jornada may look like a standard notebook PC, but it's one of the first machines to feature the new Windows CE Professional Edition. This lets devices run at VGA and SVGA resolutions, so CE machines are finally viable as notebook replacements, hence the Jornada. It's got a nice, fast StrongARM processor and a claimed battery life of 15 hours. We'll be testing it just as soon as we can get our hands on one.

Price **£849 (£722.55 ex VAT)** **Contact** **Hewlett-Packard 0990 474747 www.hp.com**



PULSAR 350

- Intel® Pentium® II Processor 350Mhz
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- Intel® 440BX Chipset
- 8Mb ATI Rage Pro (2xAGP) Graphics Card
- 512K Cache
- 6.4Gb (UDMA) Hard Drive
- 32x CDROM Drive
- PCI 64 3DP Sound Card
- 56K Modem
- In-built Microphone
- Built-in Speakers with 10 Watt Subwoofer
- 7 PCI/ISA slots
- 15" Monitor

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*Software bundles vary according to model. Value of software based on separate selling price of actual or equivalent software, less value of manuals not included for pre-loaded software.

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reviews

The most interesting new technology we've seen this month is Sony's **NEW F500 MONITOR**, the first totally flat-screen CRT. Watch out for more of these next month. If you've got a small amount of desk space but a large purchasing budget, the **MULTIQ FPC** could be what you're after. Those with more desk space than money should check out the **ELONEX** budget mini-tower system (p80). The small and sexy notebook market is getting popular, and **GATEWAY** is entering the fray with its magnesium-clad product. At the budget end of the scale, Umax has clambered onto the notebook wagon with the **ACTIONBOOK 330T**. Amateur photographers and computer artists should take a look at Nikon's **NEW COOLSCAN** film scanners. And, not forgetting the techies amongst you: this month we have one of the **FIRST EIDE RAID** controllers to come onto the market. On the software front, we've a couple of updates of old favourites in the shape of **TRUESPACE 4, FILEMAKER PRO 4.1** and **CLEANSWEEP DELUXE 4**. Plus, there's a newcomer in the form of the **AMAZING GIGA SAMPLER**, to turn your PC into a concert grand.

DAVID FEARON, REVIEWS EDITOR
DAVID_FEARON@VNU.CO.UK

VNU European Labs

VNU Labs tests all kinds of hardware and software, from PCs to modems to databases. All our tests simulate real-world use and for the most part are based around industry-standard applications such as Word, Excel, PageMaker and Paradox. Our current PC tests for Windows 95/98 and NT are the Sysmark tests from BAPCo. In all our performance graphs, larger bars mean better scores.

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Ratings

★★★★★ Buy while stocks last
★★★★ Great buy
★★★ Good buy
★★ Shop around
★ Not recommended

MultiQ FPC 1650 Executive
Flat panel computer

Swedish super-waif model seeks spatially-challenged execs with expensive tastes.

The LCD market is one of the fastest-growing areas of the PC world. There are strong rumours afoot concerning the short-term health of the industry, with problems caused by increased demand and the downturn in the Asian economy leading to predicted production shortages next year. All this industry doom and gloom makes the timing of MultiQ's launch particularly intriguing. FPC stands for Flat Panel Computer, and MultiQ is a successful Swedish flatpanel company that has sold LCDs since 1988. Although it has an impressive share of the market in Scandinavia, the company is relatively unknown here.

MultiQ is keen to stress the innovation in its product, claiming that its FPC is an LCD screen with a PC built in. Previous attempts have approached the concept the other way around. It backs up its claim to originality with the prize the FPC won for the most innovative product at the CeBIT trade fair in March 1998.

Minimalist Swedish design doesn't come particularly cheap

Aimed at those who need good performance when space is at a premium, the FPC is not particularly wallet-friendly, but then, as everyone knows, minimalist Swedish design doesn't come particularly cheap. Having turned to R&D partner Inside Technology, which specialises in producing single-board computers, MultiQ's product contains the PC on the back of the LCD screen, yet is still no thicker than two inches at its widest point.

The screen itself is connected to a base containing the floppy drive and CD-ROM: the casing is entirely metal, giving the unit confidence-inspiring solidity. With the mouse and slim keyboard connected to the base, and the screen and PC as one unit, the 10Kg FPC bears a slight resemblance to the iMac in its minimalist design. The only spanner in the works, which affects the FPC's asceticism, is the whacking great power unit sitting next to the system, connected by an ugly, thick, black power cable; you'll probably want to hide it. Comparable to a 17in CRT monitor in viewable area, the 15.1 in TFT (Thin Film Transistor) screen was impressive in tests, showing the Windows 98 icons off in all their pixellated glory on its 1,024 x 768 resolution. The viewing angle was not too impressive but this is less of an issue with a PC that will not be used for PowerPoint presentations. But it is the ideal solution for, say, a spatially-challenged trading floor or newsroom.

So what hardware do you get for your hard-earned cash? The slim 3.2Gb Toshiba hard drive is packed with the motherboard behind the screen. The board contains 64Mb of SDRAM, alongside the 512K of L2 cache, as well as the 4Mb Chips & Technology onboard graphics chipset. MultiQ claims that its FPC's form factor has been designed for modularity: the basic configuration can be upgraded before being built and the basic components easily upgraded once purchased. The FPC can be fitted with up to 256Mb of RAM, and MultiQ uses processors from both Intel and AMD, offering up to an AMD K6-2 processor running at 333MHz, which should be ample for nearly all office packages.

The system we tested was fitted with an Intel 233MMX processor. There are eight screws in all which have to be taken out to gain total access to the back of the screen and, if you want to take off the central back plate (pretty essential if you want to upgrade, as it covers most of the main components), you will need to detach the screen from the base. All in all, this is a task best left to a specialist. MultiQ has contracted the warranty and technical support to a third-party British company, so you won't have to ring Stockholm if anything goes wrong. Similarly, British orders for the FPC are through MultiQ's UK partner, distributor Imago Micro.

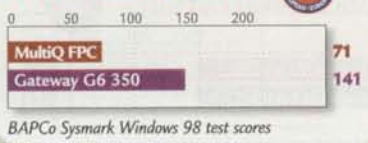
PAUL TRUEMAN

PCW DETAILS

★★★★

Price *£3,643 (£3,100 ex VAT)*
Contact *Imago Micro 01635 294300*
www.multiq.com
Good Points *Looks great. Takes up little space. Modularity for potential upgrades.*
Bad Points *At this price, such designs won't be affordable to everyone.*
Conclusion *Well worth consideration if space is at a premium and you want to make everyone else jealous.*

PERFORMANCE RESULTS



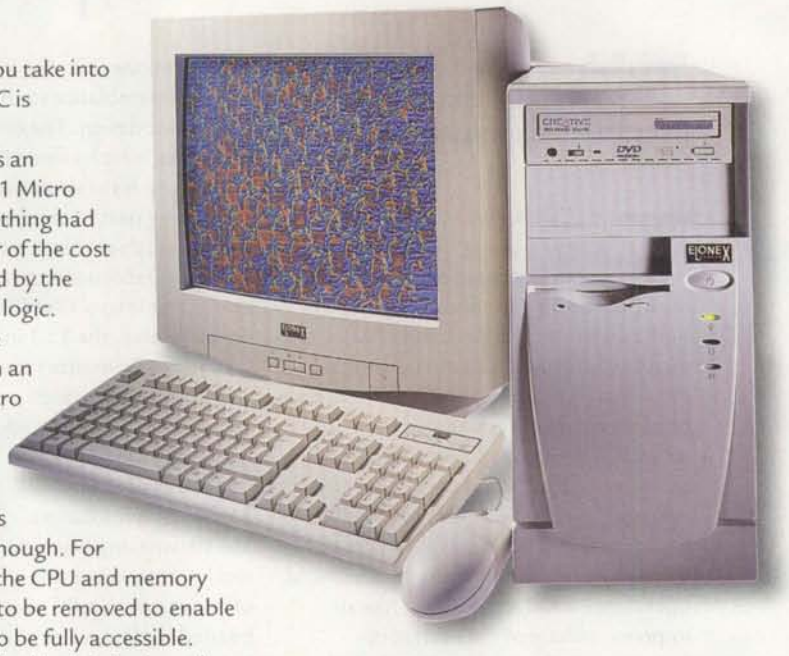
BAPCo Sysmark Windows 98 test scores

Elonex MCX-6350/I
Compact mini tower

Goodbye Intel... hello Via Apollo Pro. The alternative chipset in a good value PC.

Elonex's latest system is an interesting showcase for the first available alternative Slot 1 chipset which comes in the shape of the Via Apollo Pro. Until now, Intel has had the monopoly on Slot 1 chipset production, meaning that not only was it making pots of cash selling PIIs and Celerons, it was making even more producing the chipsets to run them. This competition should benefit consumers.

The Apollo Pro claims some key improvements over the highest-specification Intel equivalent, the 440BX, including support for up to 1Gb of PC100 SDRAM with the option to mix and match with 66MHz SDRAMs, and support for the emerging ATA-66 disk (aka the ULTRA DMA 66) drive interface standard. ATA-66 effectively doubles the maximum data transfer rates of the current generation of EIDE drives. Unfortunately, the FIC KA-6130 motherboard supplied with this system puts some constraints onto these leading-edge features. One obvious limitation is that there are only two DIMM sockets so with the maximum 256Mb modules currently available the maximum the chipset can handle is cut in half. When you take into account that FIC is targetting this motherboard as an affordable Slot 1 Micro ATX, then something had to give in favour of the cost savings afforded by the alternative core logic.



Housing the motherboard in an uninspiring Micro ATX case gives you a compact mini-tower system. This has its drawbacks though. For instance, both the CPU and memory DIMM needed to be removed to enable the hard drive to be fully accessible. Generally, it's all a bit tight in there, but what you get is impressive for the price.

The system is powered by a 350MHz Pentium II. The generous 128Mb of RAM is supplied on one DIMM, so there's still room for memory expansion. But with 128Mb you are not going to need to upgrade for quite some time. Fujitsu provides generous storage with a 6.4Gb EIDE hard disk with an Ensoniq sound system squeezed onto the motherboard. CD-ROM capabilities are provided by Creative Labs' Dxr2 DVD-ROM drive but there is no accompanying hardware DVD Video decoder to go with it. Consequently, movie playback has to be carried out in software, and even a 350MHz processor has trouble with this.

Improvements over the highest-specification Intel equivalent

The graphics card is a new Leadtek model, and is equipped with nVidia's Riva TNT chipset, which is the best around at the moment. It is fitted with 16Mb SDRAM. Buying a mini-tower system will always constrain your upgrade options, as evidenced by the two spare PCI slots. Spare drive bays are also reduced to one 3.5in and one 5.25in. Elonex supplied its own branded monitor, capable of reasonable refresh rates at high resolution (85Hz at 1,024 x 768) but the overall image lacked sharpness. This was more acceptable at 800 x 600, which is unfortunate for a 17in display. All the necessary screen control functions are available through a basic OSD that's easy enough to use.

An excellent user manual guides you through any problematic areas of setup, and there's a diagnostics section for troubleshooting.

In our benchmark tests, the system returned a slightly disappointing result. This may well be have been because of the early revision of both the motherboard chipset and the Leadtek video drivers. Hopefully, though, future systems will definitively demonstrate that Intel has some competition on its hands in the Slot 1 chipset arena.

The system's major selling point is its price. Despite the fact that the performance of the MCX-6350/I is slightly slow for the specification, in absolute terms it is still a powerful PC for remarkably little cash.

IAN ROBSON

PCW DETAILS

★★★

Price *£998.75 (£850 ex VAT)*
Contact *Elonex 0181 452 4444*
www.elonex.co.uk
Good Points *Compact. Well specified.*
Bad Points *No MPEG hardware decoder. Restriction on upgrade options.*
Conclusion *A lot for the money, but other 350MHz systems are faster.*

PERFORMANCE RESULTS (VNU LABS)

BAPCo Sysmark Windows 98 test scores

Gateway Solo 3100 FireAnt
Stylish boy toy

A petite notebook fashion accessory for the busy young executive-around-town.

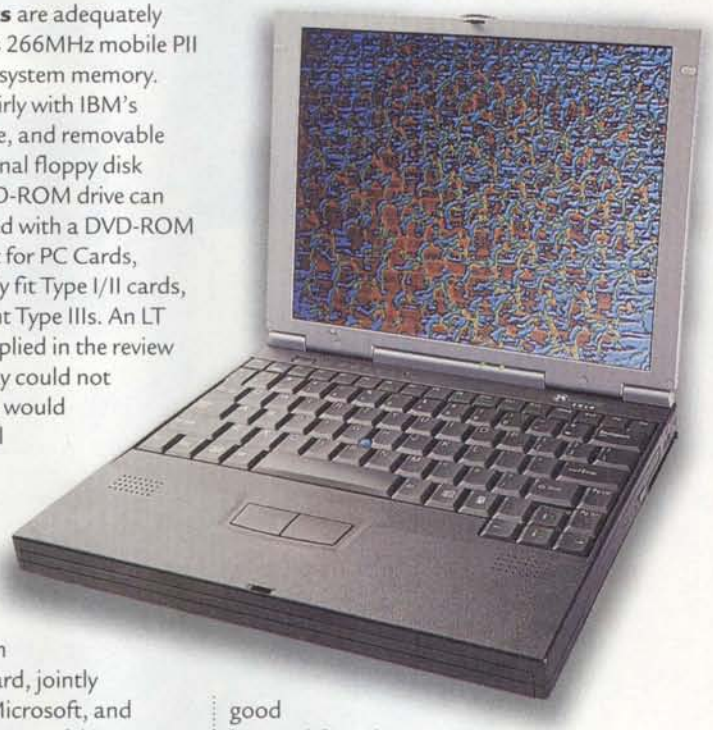
Gateway has established a reputation as a major player in the notebook market with an extensive range to suit most users' needs. The Solo 3100, codenamed FireAnt, fits snugly into a niche best described as the executive's stylish toys market. Gateway would probably phrase it slightly differently, but there's no doubt that the target audience for this one is the executive on the move.

The FireAnt comes in a two-tone casing with its 12.1in TFT screen housed in magnesium alloy. The rest is in black plastic. With its petite dimensions (285 x 215 x 31mm) and favourable weight (2.27Kg with battery) it is designed to be a piece of techno-jewellery that fashion-conscious executives will want to own. The screen's native resolution of 800 x 600 is fine for most tasks and delivers a bright, even, display. The screen housing, however, is thin enough to twist when repositioning, causing distortions of the image. This is nothing major but we'd have thought that the metal top would stop this. It also seems a shame not to have taken advantage of the natural heat dissipation qualities of the magnesium in the rest of the casing.

Designed to be a piece of techno-jewellery

Keyboard feel is very light indeed, although it does feel a little flimsy. Some may prefer their keys to have a more positive touch. The mouse pointing device is the mini-joystick type beloved by IBM. It nestles in the middle of the keyboard and a little pressure from your fingertip sends the pointer in the appropriate direction. There is no port replicator supplied as standard, but it is available as an option. Added replicator features include S-Video out and stereo speaker inputs. It can be permanently plugged into a power supply to recharge the Lithium Ion battery pack.

The FireAnt's looks are adequately complemented by its 266MHz mobile PII with 32Mb supplied system memory. Storage is covered fairly with IBM's 4.2Gb hard disk drive, and removable storage with an external floppy disk drive. The integral CD-ROM drive can optionally be replaced with a DVD-ROM unit. There's one slot for PC Cards, meaning you can only fit Type I/II cards, rather than full-height Type IIIs. An LT WinModem was supplied in the review machine but Gateway could not confirm whether this would follow through to full production.



Gateway claims that the FireAnt is ACPI compliant. ACPI (Advanced Configuration & Power Interface) is an open industry standard, jointly developed by Intel, Microsoft, and Toshiba. The key element of this standard is to put the operating system in control of power management. However, it will be a while before full software support is available to take advantage of it.

Graphics are provided by the ubiquitous NeoMagic chipset. This does not provide any of the whizzy 3D features of some newer chipsets but does the job perfectly well for standard applications.

Options to upgrade are limited to storage and memory; both easily achieved with the loosening of a couple of screws. There is also easy access to the more private parts, although these are not generally regarded as user-serviceable areas. Battery life, as is usual with Gateway notebooks, is impressive with the unit managing three hours on a full charge with all power management turned off.

Is it better than the Sony PCG-505G (*reviewed in* PCW, *Dec '98*) which is almost identical in price? Well, it's slightly better specified, with a mobile PII rather than the 505's 233MMX, it has good battery life and comes bundled with Microsoft Office 97 Small Business Edition as well as Money and Encarta 97. It does not have a port replicator as standard, however. But there cannot be many who would look at both, side by side, and choose the Gateway. Sony's product is just too gorgeous. And there's more competition on the way. Sharp has a unit with a similar design.

Overall, the FireAnt displays the usual qualities of Gateway notebooks: competent and well-specified but lacking in that touch of flair, despite the shiny top.

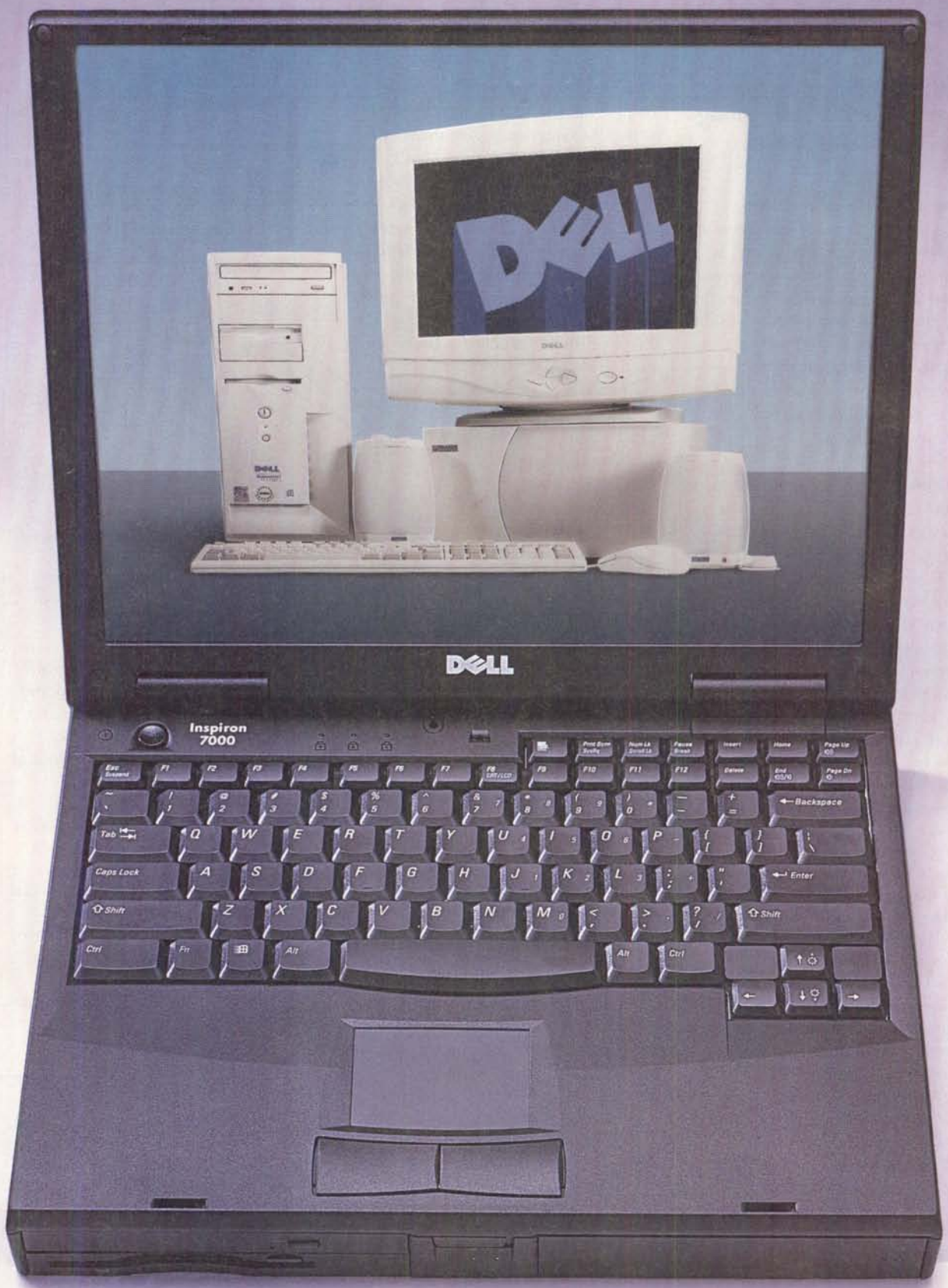
IAN ROBSON

PCW DETAILS

★★★

Price *£2354.70 (£2004 ex VAT)*
Contact *Gateway 0800 552000*
www.gateway.com/uk
Good Points *Stylish and light.*
Bad Points *Not quite* that *stylish. Slightly flimsy build.*
Conclusion *It's appealing but not as appealing as Sony's similarly-priced PCG-505G.*

Acts like one thing.
Looks like another.



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- TV Out (PAL & NTSC)
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- 2 Cardbus PCMCIA type II Slots
- Lithium Ion Battery
- Touchpad with 2 buttons
- Zoomed Video Support
- Infrared communication port (IrDA 1.1 compatible)
- USB Port
- Microsoft Home Essentials™ 98
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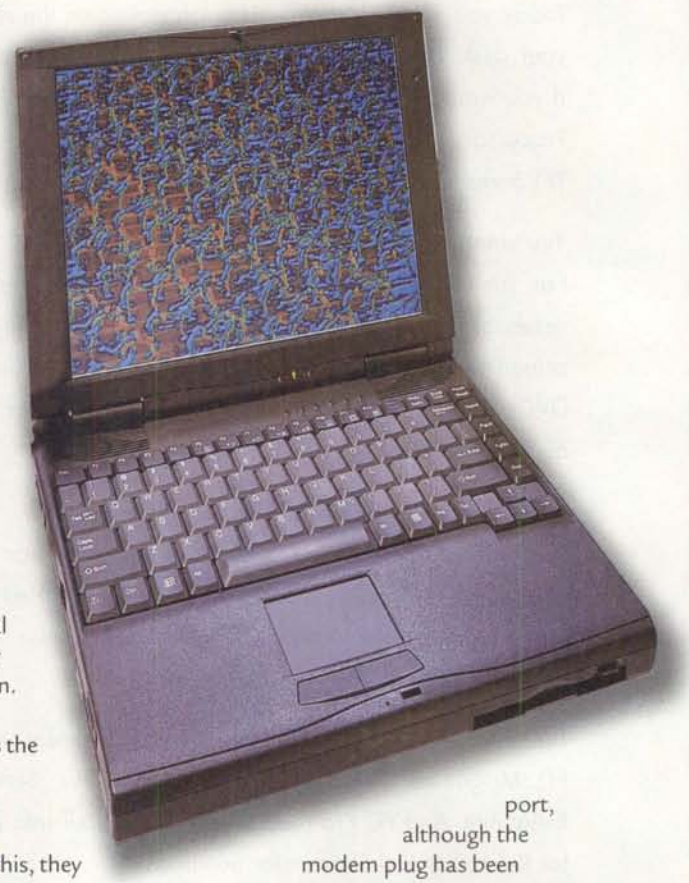
Umax ActionBook 330T
Budget notebook

Umax's first notebook at entry-level is well down in the bargain basement.

The ActionBook is Umax's first dip of a toe into the notebook market. Umax is best known for its scanners for graphics professionals and for home users, but it was also the first company to sell Mac clones. However, even before Apple's decision to keep the Mac OS to itself, Umax had started to make NT workstations, arguing that even traditional Mac users were making the move to PCs simply because they were cheaper, more powerful and more stable.

Umax first announced its intention to produce notebooks well over a year ago. Its approach is to come in at the low end, appealing mainly to those who want a second machine but do not want to pay a fortune for it. Higher-end notebooks, with faster processors and larger screens, are already on sale in America and will be coming here soon. Also in the US, Umax is selling low-end PCs based around the AMD K6-2, although in the UK it is unlikely to go down this path in the near future.

An AMD processor has found its way into the ActionBook 330T. The unit sports the K6/300 mobile, a relatively new processor which generates less heat and consumes less power than the desktop version. In practice though, the ActionBook seems to run extremely hot; a problem that is apparent almost as soon as you start using it. Within about ten minutes of switching it on, the fan kicks in. This in itself would not be a problem if it were quieter, but it sounds a little like one of those creaky old desk fans, complete with an annoying background whine. And, once the fan has come on, it does not switch off again.



The Action Book is fitted with an NiMH (Nickel Metal Hydride) battery – an older technology than Lithium-Ion. NiMH is heavy but the real problem is what's known as the "memory effect". NiMH batteries should be fully discharged before they are recharged. If you fail to do this, they will subsequently tend to refuse to take a full charge, meaning reduced life on-the-road. Even with the new battery, we found that it ran down astonishingly quickly on relatively light activity, lasting only around an hour in normal use.

Unfortunately, the approach of low budget rather than high quality also runs to the screen. This was a 12.1in TFT display, which runs at a resolution of 800 x 600. Although small compared to the 14.4in screens in some of the current wave of notebooks, it is still large enough to work on. However, our greatest gripe about the screen is its quality. Some light bleeds around the edge of the screen, particularly at the top and to the right, yet the screen itself is neither as bright nor as clear as it should have been. Windows icons were badly defined and the contrast was terrible. Let's hope Umax improves this on its later models.

The ActionBook 330T has all the ports you might expect, including a USB port, although the modem plug has been blocked off. The keyboard is pleasant enough to use and the trackpad is reasonably responsive. There is a distinct lack of any of the bundled utilities you would normally find on a notebook. It does not even have a power management utility, so you have to use the Windows Power utility instead. The only bundled software you get is Windows 98.

An AMD processor has found its way into the ActionBook

The RAM and hard disk are adequate, with 32Mb of system RAM, 2Mb for the graphics chipset and a 4Gb hard disk. The CD-ROM and floppy disk are both integrated into the case so you don't have to pull one out before you can use the other, but this is about the limit of the notebook's good points. Overall, the ActionBook 330T feels like a notebook which is a couple of years old and has merely had a few newish components added.

ADELE DYER

PCW DETAILS

★★★

Price *£1,174 (£999 ex VAT)*
Contact *Umax 01344 871344*
www.umax.co.uk
Good Points *Budget price.*
Bad Points *Feels cheap.*
Conclusion *You get what you pay for.*

PERFORMANCE RESULTS (VNU LABS)

BAPCo Sysmark Windows 98 test scores

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Sony Multiscan GDM-F500
First flat screen CRT

Just eyeball this will you? It's totally flat, it's Trinitron, and it uses a cathode ray tube...

With the F500, Sony has achieved something that a couple of years ago most people would have said was a practical impossibility. The F500 is the first flat screen Trinitron as well as the first flat screen CRT (cathode ray tube) monitor to be released. Screens based on Sony's Trinitron technology and its derivatives (collectively known as aperture grille displays) have always been flat in the vertical direction, but curved width-wise. Monitors based on shadow mask technology are curved in both directions, although as the technology has matured over the years, they have been getting flatter.

The F500 is a heavy beast at 34Kg but that's par for the course in a 21in display – the flat screen tube does not significantly add to the weight. It has to be said, however, that the penalty you'll pay for flat-screen heaven is the aesthetics of the thing. In contrast to most Sony products, which are as elegant as you could want, the F500 is dowdy-looking in the extreme.

The on-screen menu system is identical to that used in Sony's other high-end 19 and 21in Trinitrons. But that's no bad thing as it's one of the most intuitive menu systems around. Where it does depart from other models is in its physical controls. Other models have four buttons arranged in a cluster, whereas the F500 has a small joystick which performs the same function: moving it up, down, and from side to side moves through and alters the various parameters. Pushing it, selects the highlighted menu entry. Aside from the normal size, positioning and geometry adjustments, the F500 has controls to adjust vertical convergence separately for the top and bottom of the screen. It is lacking geometric linearity controls, however, but linearity is so good you shouldn't need to adjust it. The remaining front panel controls are an ASC (auto sizing and centering) button; an input selector to switch between the D-SUB and BNC connectors; and a recessed reset button for clearing the preset memories. Sony has responded to the rise of USB by installing one upstream and four downstream ports in the base of the unit, with the downstream ports placed two on each side.

If you're expecting the image on a flat screen CRT to look just like that of an LCD flat panel, you'll be disappointed: a CRT can never match an LCD for sharpness. The F500 is still very much a Trinitron, with all the advantages and disadvantages that go with it. Colours are superbly vivid and rich, and of course there's no commercially available flat panel that will achieve resolutions of 1,600 x 1,200, let alone the maximum 1,800 x 1,440 that the F500 supports.

The flat screen tube does not significantly add to the weight

To do the F500 justice, we tested it using a Matrox Millenium G200 graphics card which ranks as one of the top performers for 2D quality, as well as being one of the few to support really high resolutions. In practice, the flat screen does not appear to have introduced any image quality compromises, quite the reverse: the F500 gives a superbly crisp image at 1,600 x 1,200, with virtually no geometric compensation required and amazingly little distortion in the corners. At 1,800 x 1,440 things are still almost flawless, but text begins to get too small to be practical.

Does a totally flat screen really make the display "better" or easier to use? Well, in practice there's certainly something very pleasant about sitting in front of the F500. We're all naturally used to flat working surfaces, notably paper documents, so you'll feel completely at home with the unit. There's also the argument that a flat screen reduces reflections which can interfere with the image on which you're trying to concentrate, which contributes to fatigue and eyestrain. But this is a monitor for those who really care about their displays and, if you fall into that category, the premium price of the F500 is one worth paying.

DAVID FEARON

PCW DETAILS

★★★★

Price *£1,526 (£1,299 ex VAT)*
Contact *Sony 0990 424424*
www.sony.com
Good Points *Totally flat screen. Gorgeous colour rendition and crisp text. Runs at up to 1,800 x 1,440 at 80Hz.*
Bad Points *The case design looks ungainly. It's awfully expensive.*
Conclusion *If you can afford one, buy one.*

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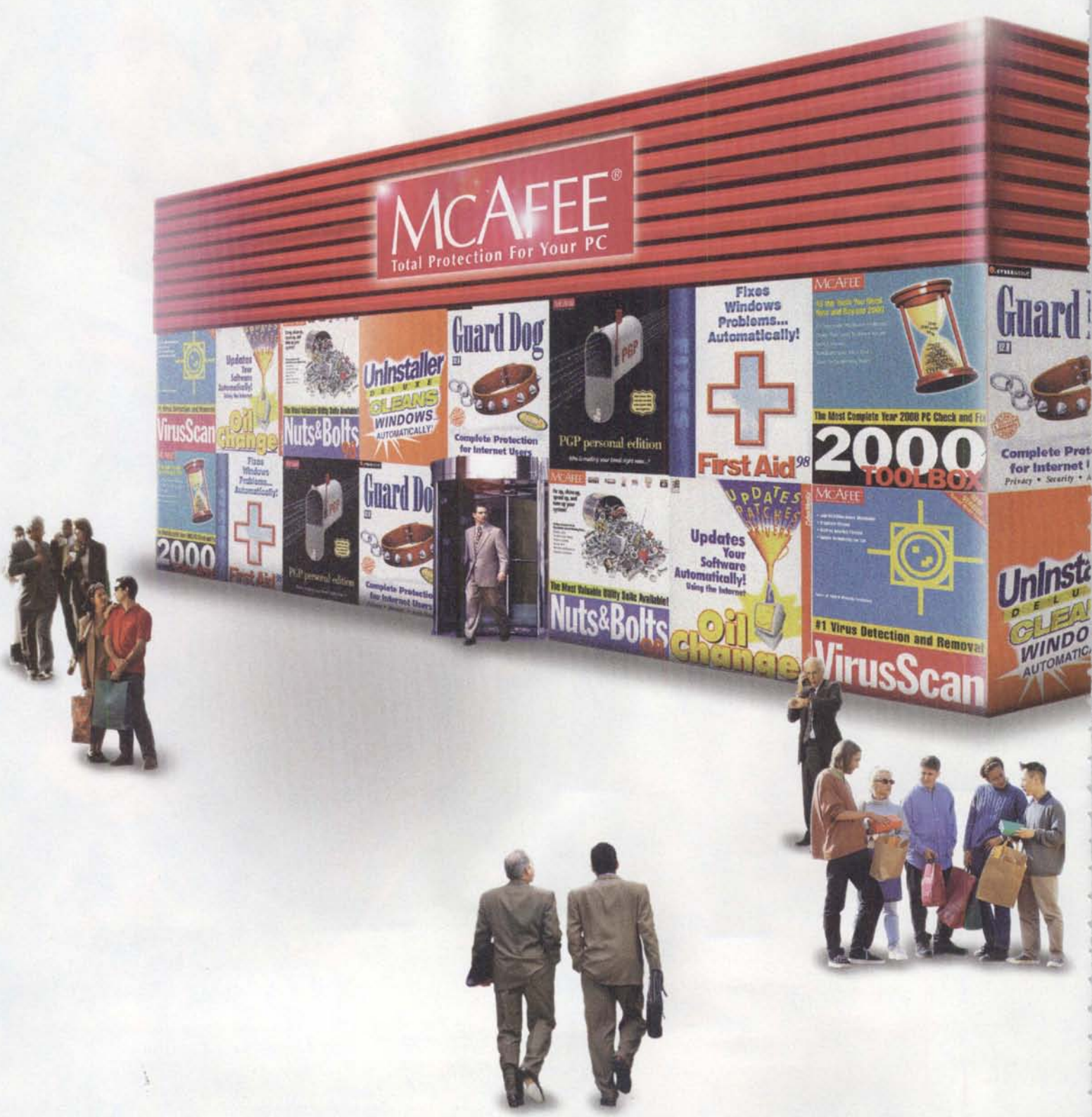

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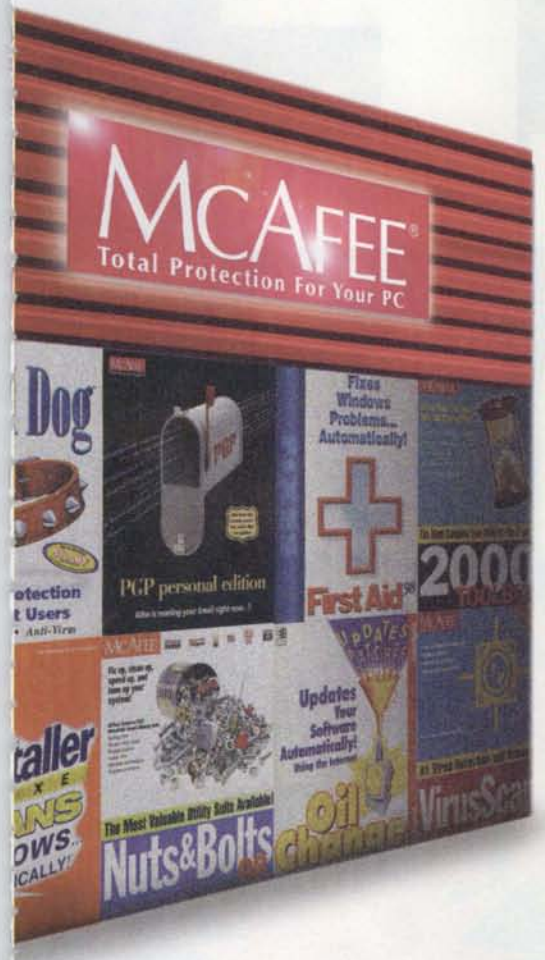

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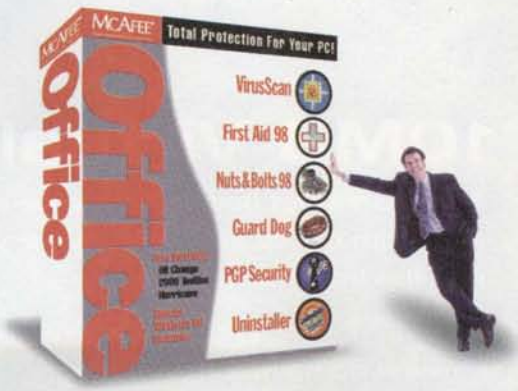

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35mm and APS film scanners

Dedicated desktop film scanners — here are two models from which to choose.

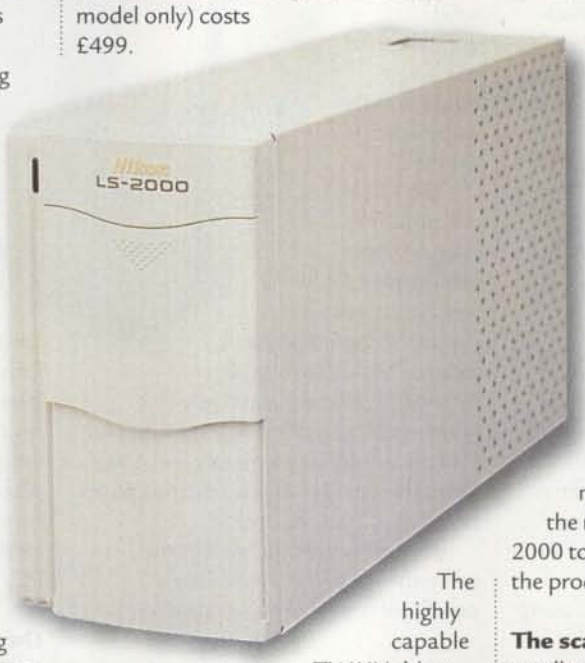
With reputable manufacturers producing perfectly good flatbed scanners at under £100, why on earth would you consider spending £619 or £1,399 for Nikon's LS-30 or LS-2000 dedicated film scanners? The reason is that scanning film is considerably different from capturing your holiday prints or business documents. First it's transparent, and second it's usually very small. Transparency can be solved by shining a light through the image, and most flatbeds can be fitted with optional illuminated lids to do just that. But size is a trickier one to solve.

A flatbed scanner has plenty of dots to play with for your 7 x 5in print, but 35mm film measures only an inch tall. A 600 dpi flatbed would then give you, well, only 600 dots. Considering that most colour inkjets like at least 150 dots per printed inch, then you're only looking at a maximum enlargement of four times – that's only four inches tall, and hardly worth the effort.

Nikon's LS-30 and LS-2000 film scanners (aka the CoolScan III and Super CoolScan 2000) both boast a hefty 2700 dpi optical resolution, good enough to enlarge a 35mm frame to A3 on an average colour inkjet. Both models measure 85.5 x 142 x 275mm and are SCSI-II devices. Nikon supplies an Adaptec 2902 SCSI card with the LS-30 but expects you to have your own for the LS-2000. We tested both scanners on a P200 with 128Mb RAM and a fast Adaptec 2940 PCI SCSI card.

Both units boast a hefty 2,700dpi optical resolution

The front panel of each unit slides down to reveal a large slot into which a variety of film adaptors can be hot-plugged. Nikon supplies two with each scanner: one sucks in raw, uncut lengths of film from two to six frames, and another swallows mounted slides whole, or a strip film adaptor for those pesky loose frames. An optional APS film adaptor is available for £159, and one to automatically sort through and scan up to 50 mounted slides (on the LS-2000 model only) costs £499.



The highly capable TWAIN driver, tested at v2.1, operates both models and boasts just about every adjustment you could think of for the expert, or auto settings for those who want an easy life. In fact, Nikon can make things even easier by automatically getting rid of any scratches, dirt and fingerprints by making an extra pass with its Digital ICE technology. This works really rather well and, despite lengthening scanning time, is much quicker and less frustrating than doing it by hand. Nikon also supplies Photoshop 4 LE with both models, which no doubt will come in handy.

The big difference in price between the two scanners is essentially down to their colour depth: the LS-30 captures 30 bits at input, and outputs 24, while the LS-2000 boasts 36 bits at input and output. In real terms, this means the LS-2000 can see a wider range of colours and, in particular, capture subtle detail in dark shadows and bright highlights. When you consider that every adjustment to colour, brightness and contrast effectively loses bits, then starting with 36 will ensure you still have a decent 24 left even after significantly playing around. A multiple sampling mode, which is only available on the LS-2000, can cancel digital noise on the CCD and increase dynamic range yet further; the LS-2000 is also supplied with SilverFast software for precise colour adjustment. At 2,700 dpi you're looking at just under a minute for 36-bit (57Mb) scans from the LS-2000 or 30 seconds for 24-bit (28.5Mb) scans from the LS-30. Activating Digital ICE increases these times to four and three minutes, respectively. Reducing the resolution (or dropping the LS-2000 to 24-bit) significantly speeds up the process.

The scans from both models are excellent but feeding the LS-2000 a demanding image, employing Digital ICE and multiple sampling, impresses even further. Sure, you can't do anything other than scan 35mm or APS film with these units, but they both do it well enough to more than justify their prices to professional users and serious enthusiasts alike.

GORDON LAING

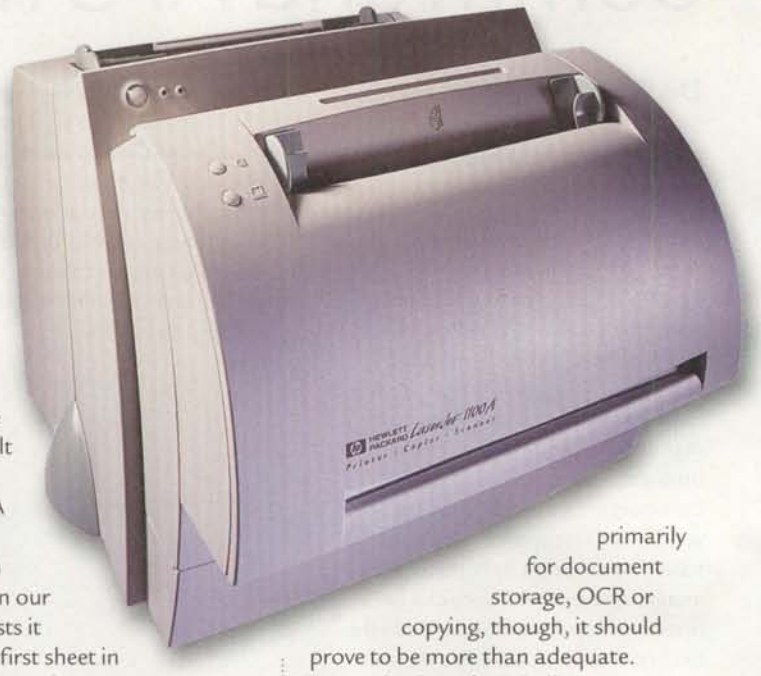
PCW DETAILS

★★★★

Price *LS-30: £619 (£527 ex VAT), LS-2000: £1,399 (£1,191 ex VAT)*
Contact *Nikon 0800 230220*
www.nikon.co.uk
Good Points *Best film scans outside the pro-bureau.*
Bad Points *Pricier and less flexible than most flatbeds available.*
Conclusion *35mm and APS film fans, look no further.*

Hewlett-Packard LaserJet 1100A

A compact dual function device for the home and office.



The 1100A isn't a totally new product from HP. It is, however, an interesting variation on the standard 1100 printer: it has a scanner attachment, turning the unit into two-thirds of a multifunction device (the missing element being an integrated fax). It also means, of course, that you'll find yourself with more free desk space as you avoid cluttering up your work area with cables and individual peripherals. The scanner unit attaches very easily via one of those ingenious lever arrangements that printer manufacturers are so good at doing.

So what do you get for your money? Well, this monochrome laser has 2Mb RAM as standard, which it uses to print pages at a maximum resolution of 600dpi. It meets Energy Star guidelines and the memory can be upgraded to 18Mb using EDO DIMMs at a later date. The standard connection is to the parallel port and it chats to the PC using HP's own PCL5e control language. Network compatibility is available to those hooking it up to one of HP's optional JetDirect external print servers. Drivers are included for every version of Windows from 3.1 to 98, but while NT4 is also catered for, there is nothing for users of NT version 3.51.

The 1100A prints pages at a maximum resolution of 600dpi

The 1100A incorporates Hewlett-Packard's own REt (Resolution Enhancement technology) to improve the quality of its output, and this undoubtedly helped it to achieve an impressive score of 84.25 percent in our printer tests. Toner was well fused to the paper and demonstrated only minor cracking when our pages were folded, although on a page of almost complete coverage there was slight variation in the level of toner density. Some problems with banding were also evident, but if the unit is mainly used for text output, as are most mono lasers, this will not be too much of a drawback. It's with areas of solid graphics that banding tends to make its presence felt the most.

The 1100A is claimed to have an 8ppm print engine. In our text output tests it produced the first sheet in a run of 10.5 complete pages 19 seconds after the data light first illuminated, and the final page dropped into the output tray a minute and a half later. This equates to just under six pages per minute in the real world.

We were underwhelmed by the performance of the printer in our positional test, in which a crosshair pattern is overprinted on itself, requiring the page to be passed through the unit twice. Whilst a printer scoring ten would have printed the images so perfectly on top of each other that only a single crosshair would be discernable, our test results could only let us award the 1100A a score of three. An important point if you want to do any manual duplex printing.

Once attached, the scanner facilitates one-touch copying with an optical resolution of 300dpi, without even being connected to the PC. The scanner is the document feeder type rather than a flatbed so performance isn't brilliant, scoring just 70 percent in our scanner tests. It is, however, versatile enough to cope with anything between 2 x 3.5in and a maximum of 8.5 x 30in in size. For the business user wanting to use it primarily for document storage, OCR or copying, though, it should prove to be more than adequate. Connecting it to the PC allows you to interpolate the optical scanning resolution to achieve 600dpi. A 20-page input hopper allows copying to take place unattended, although without a front panel it is not possible to make multiple copies without the use of the PC.

Our only real disappointment with the 1100A was that there was no front-mounted output tray to catch either our originals as they passed out of the scanner or any prints exiting the "straight" paper path. That said, the unit does have a 125-sheet feeder for both paper input and output should you choose to use the curved path.

NIK RAWLINSON

PCW DETAILS

★★★★

Price *£446.50 (£380 ex VAT) or £364.25 (£310 ex VAT) for printer alone.*
Contact *Hewlett-Packard 0990 474747*
www.hp.com
Good Points *Modular design. Ease of use. Good value for money.*
Bad Points *Lack of front-mounted paper output tray.*
Conclusion *A good choice for those who need a compact mono text printing and document processing solution.*

Just how much does an EPSON scanner see?

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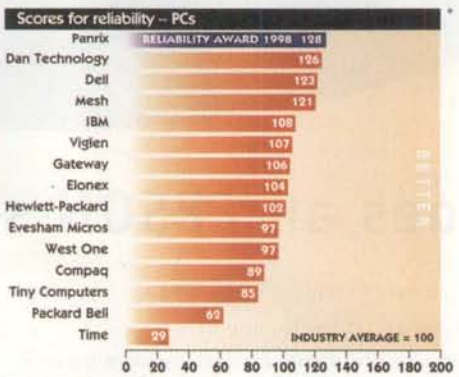

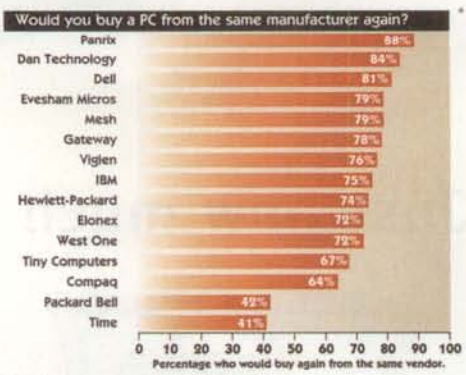

*Graphs show the performance of the top 15 PC manufacturers surveyed by PC Pro relative to each other and, where relevant to an industry average.

Personal Computer World Highly Commended	Most Desirable Computer Shopper Labs	PC Pro Speed	Editor's Choice Computer World	PC Pro Speed	PC Pro Reliability Award 1998	Editor's Choice Computer World	PC Pro Recommended	PC Advisor Recommended	PC Advisor Recommended
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MODEL	Nitro	Thunder C	Lightning (INTERNET READY)	Fusion-Ultra (INTERNET READY)	Fusion-SCSI
PROCESSOR	**AMD K6-2 350MHZ CPU**	**Intel Celeron® 300MHz 128K cache**	**Intel Pentium®II 350MHz**	**Intel Pentium®II 400MHz CPU**	**Intel Pentium®II 450MHz CPU**
MOTHERBOARD	Super Socket 7	Intel 440BX Chipset Motherboard	Intel 440BX Chipset Motherboard	Intel 440BX Chipset Motherboard	440BX Chipset Onboard Adaptec 7890
RAM	32MB SDRAM	64MB SDRAM	64MB PC100 SDRAM	64MB PC100 SDRAM	128MB PC100 SDRAM
HARD DRIVE	5.1GB Ultra-DMA Hard Drive	6.4GB Ultra-DMA Hard Drive	7.5GB Ultra-DMA Hard Drive	10.1GB Ultra-DMA Hard Drive	9.1GB Ultra SCSI-2 LVD 10,000 RPM HDD
GRAPHICS	4MB 64-bit AGP Graphics	8MB Diamond Speedstar AGP Graphics	8MB Diamond Stealth II AGP Graphics	8MB AGP Matrox Milennium G200	8MB AGP Matrox Milennium G200
FLOPPY DRIVE	1.44MB 3.5" Floppy	1.44MB 3.5" Floppy	1.44MB 3.5" Floppy	1.44MB 3.5" Floppy	1.44MB 3.5" Floppy
DVD/CD ROM	36x Asus EIDE CD-ROM	36x Asus EIDE CD-ROM	36x Asus EIDE CD-ROM	40x Asus EIDE CD-ROM	14/32x Ultraplex SCSI CD-ROM
MONITOR	15" CTX Digital Monitor	15" CTX Digital Monitor	15" CTX Digital Monitor	15" CTX Digital Monitor	17" Iiyama VisionMaster Pro Monitor
CASE	ATX Mini Tower/Desktop Case	ATX Mini Tower/Desktop Case	ATX Mini Tower/Desktop Case	ATX Mini Tower/Desktop Case	ATX Max Mini Tower/Desktop Case
SOUND CARD			3D PCI Sound Card	PCI Creative Labs SB 64	PCI Creative Labs SB 64
SPEAKERS			160 Watt (PMPO) Stereo Speakers	Yamaha M20 Stereo Speakers	Yamaha M20 Stereo Speakers
MODEM			56.6 V.90 PCI Internal Voice/Fax/Modem	56.6 V.90 PCI Internal Voice/Fax/Modem	56.6 V.90 PCI Internal Voice/Fax/Modem
KEYBOARD	UK Win '98 Keyboard	UK Win '98 Keyboard	UK Win '98 Keyboard	UK Win '98 Keyboard	Fujitsu 98 UK Keyboard
MOUSE	Microsoft Intellimouse	Microsoft Intellimouse	Microsoft Intellimouse	Microsoft Intellimouse	Microsoft Intellimouse
SOFTWARE	MS Windows '98 CD	MS Windows '98 CD	MS Windows '98 CD Ultra Pack 10 CD's inc. SmartSuite'97	MS Windows '98 CD Ultra Pack 10 CD's inc. SmartSuite'97	MS NT v4 Workstation CD Lotus SmartSuite 97CD
WARRANTY	12 Months Return to Base	12 Months Return to Base	12 Months On-site	12 Months On-site	12 Months On-site
PRICE	**£565** ex vat £663.88 inc vat	**£650** ex vat £763.75 inc vat	**£895** ex vat £1051.63 inc vat	**£1185** ex vat £1392.38 inc vat	**£2095** ex vat £2461.63 inc vat
QUOTE REFERENCE No.	26793	26795	26797	26799	26801
EASY PC	**£21.20 Per month**	**£23.87 Per month**	**£33.58Per month**	**£44.46 Per month**	**£79.15 Per month**
BUSINESS LEASE RENTAL	£19.76 Per month	£22.74 Per month	£31.31 Per month	£41.45 Per month	£73.28 Per month
UPGRADE OPTION	**AMD K6-2 400MHz CPU** 3D PCI Sound Card 160 Watt (PMPO) Stereo speakers	**Intel Celeron® 333MHz 128K cache** 17" Digital Monitor 10.1GB Ultra-DMA Hard Drive	**128MB PC 100 SDRAM** 17" Digital Monitor 10.1GB Ultra-DMA Hard Drive	**128MB PC100 SDRAM** 17" Digital Monitor 5x DVD Drive M-Peg decoder	**Dual Intel Pentium® II 450MHz CPUs** 256 MB PC100 SDRAM
PRICE	**£725** ex vat £851.88 inc vat	**£799** ex vat £938.83 inc vat	**£1075** ex vat £1263.13 inc vat	**£1395** ex vat £1639.13 inc vat	**£2695** ex vat £3166.63 inc vat
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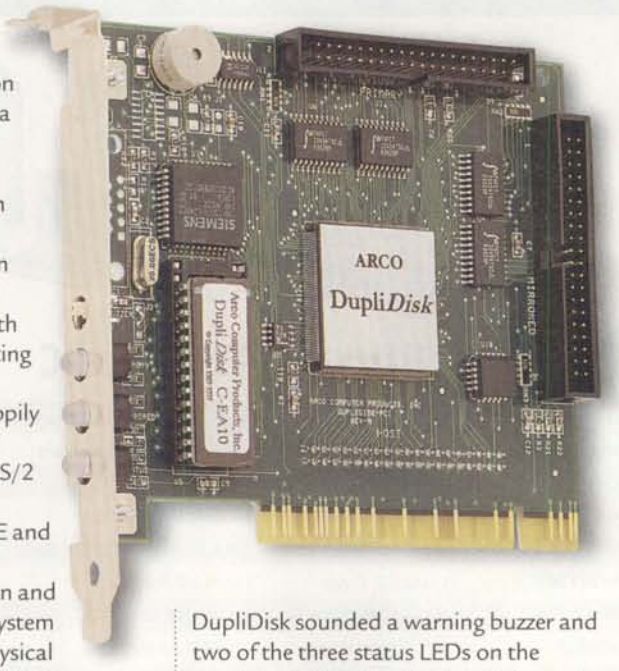
DupliDisk IDE RAID Controller

For improved performance or increased security, DupliDisk does the job.

The DupliDisk is an IDE RAID controller – yes, IDE. Traditionally, RAID controllers have only been available for SCSI hard disks. RAID – Redundant Array of Inexpensive (or Independent) Disks – allows multiple drives to be linked together to provide performance enhancements or various levels of protection against failure. The most basic level is RAID 0 where data is written in stripes across two or more drives. It provides no protection in the event of failure, but can considerably increase sustained throughput. RAID 1 requires two drives and uses one to perfectly mirror the other. Should either of the mirrored pair fail, the controller moves all operations to the remaining drive and the system continues as if nothing had happened. RAID levels 0 and 1 can be combined to provide improved performance and redundancy.

The DupliDisk provides RAID 1 mirroring only and can support up to four IDE hard disks; two primary drives and two mirrors. The drives do not need to be identical, but the capacity of each mirrored pair will be determined by the smaller drive. The DupliDisk is an intermediate adaptor that sits between the motherboard IDE controller and the drives. Four varieties are available for ISA or PCI slots: a slotless version and one for mounting in a 3.5in drive bay. The only demands the DupliDisk makes on the host system are for power and setup access. It needs neither an IRQ nor I/O address and there is no interaction with either the BIOS or operating system, making it truly universal. It will work happily with DOS, all versions of Windows, Linux, Unix, OS/2 or Novell NetWare and supports ATA, IDE, E-IDE and UDMA hard disks.



I tested the PCI version and installed it in a desktop system running Windows 98. Physical installation can be tricky due to the large number of ribbon cables required. The card has three IDE sockets with the lower one connected to the motherboard IDE channel using the supplied cable. The other two sockets are for the primary drives and mirrored drives. The rest of the testing hardware came courtesy of Western Digital with a quartet of 2.1Gb Caviar hard disks.

The DupliDisk allows multiple drives to be linked together

Once everything is in place, the RAID array is initialised using the supplied ACP DOS utility. All attached drives are displayed and ACP provides a comprehensive list of options for configuring the arrays. After the mirrors are initialised, data is copied across from the primaries. This took precisely 13 minutes to complete for each pair. After that it's business as usual. The test system started up normally, loaded Windows 98 and operated perfectly and I could detect no performance degradation whatsoever.

To simulate a complete drive failure I removed power from the primary drives before starting the system. The DupliDisk sounded a warning buzzer and two of the three status LEDs on the mounting plate turned red to indicate a drive failure had been detected. A small reset button alongside can be used to silence the buzzer. The DupliDisk provided perfect RAID 1 fault tolerance as the test system started from the mirrored drives and loaded Windows 98 as if nothing had happened. At this stage you can either continue working or take the safer option and initiate a shutdown to replace the failed units. With the failed drives replaced, the ACP utility needs to be run again to initialise them and create mirror copies of the good drives.

Clearly, the DupliDisk provides perfect RAID 1 redundancy, but it should not be seen as a replacement for normal backup as the PC or server itself still represents a single point of failure. If that dies, gets stolen or damaged then the DupliDisk won't be of any use in recovery operations. However, if you are running various mission-critical applications and need full fault tolerance for your IDE hard disks then the DupliDisk is an elegant solution.

DAVE MITCHELL

PCW DETAILS

★★★★

Price *ISA £194 (£165 ex VAT); PCI £229 (£195 ex VAT); Slotless £229 (£195 ex VAT); Bay mount £253 (£215 ex VAT).*
Contact *Octree Computers 01462 481007*
www.octree.co.uk
Good Points *Offers full RAID 1 fault tolerance to any IDE hard disk-based system.*
Bad Points *Should not be used to replace conventional data backup.*
Conclusion *Ideal as a first line of defence against hard disk failure.*

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Wacom Intuos

Wacom delivers in spades with its new graphics tablets. Perfect for the digital artist.

Let's face it: for drawing or handwriting, mice suck. The only solution is a graphics tablet, and market leader Wacom has revamped its analogue ArtPad II and UltraPad ranges with its new digital Intuos system, consisting of five new tablets and six input devices. Each Intuos pen has a unique ID which is recognised as it approaches the tablet's surface. You can set various preferences for each pen, such as the brush style and colour, and have them automatically recalled when used. The standard pen now boasts twice the pressure sensitivity than before, plus the ability to recognise tilt. Most exciting of all is a new airbrush pen (£74.95), complete with a programmable finger wheel which can be set to adjust ink flow. The intriguingly-named 4D Mouse includes the usual two rodent dimensions, along with side wheels and the ability to recognise rotation. The mouse has no ball either, or a cord or even a battery for that matter. Like the pens, it employs a resonant coil which the tablet can use for positional and control information.

All configurations are bundled with a modified version of Painter and a set of Photoshop compatible plug-ins. Prices start at £129 for the A6 with the standard pen, to the A3 with pen and mouse for £579. Our A4 regular cost £349 with pen and 4D Mouse and was great fun to use — I even found myself humming the theme to Tony Hart's Gallery.

GORDON LAING

PCW DETAILS

★★★★

Price *£152 to £680 (£129 to £579 ex VAT)*
Contact *Computers Unlimited 0181 358 5857*
www.wacom.de
Good Points *Most flexible tablets yet.*
Bad Points *No USB version so far.*
Conclusion *Essential for graphics users.*

Videologic DVD Player

One of the latest generation of hardware DVD Video decoder cards.

DVD Video needs a lot of processing power to decode if done in software. The alternative method is to design dedicated hardware to do the donkey work. This gives higher quality and more consistent results, and opens up the field to users of lower-end machines: Videologic gives a minimum processor spec of a Pentium 133, meaning that DVD will finally be within the budget of many PC users.

Remember that DVD Video will only look its best on a television: a monitor is actually "too good", meaning that any pixellation is very obvious, whereas the extremely bright, slightly fuzzy image of a telly tends to smooth out these kind of problems. Consequently the DVD Player sports a composite video output for hooking up to a TV. The first-generation PC-based DVD decoders were disappointing, giving slightly inconsistent frame rates and less than ideal image quality but the DVD Player far exceeds any VHS video you'll have seen.

To watch films on your PC monitor, you need to route the output of your graphics card into the socket on the back of the card. You then connect the monitor itself to the DVD Player. When you're playing a DVD movie, the card then overlays the movie picture onto the signal from your monitor. A little thought reveals that a consequence of this is the fact that you can't do standard screen grabs using Paint Shop Pro or whatever. The DVD Player software, however, has a screen grab function, but some DVD titles don't allow this.

DAVID FEARON

• *See this month's group test of DVD drives, page 213.*

PCW DETAILS

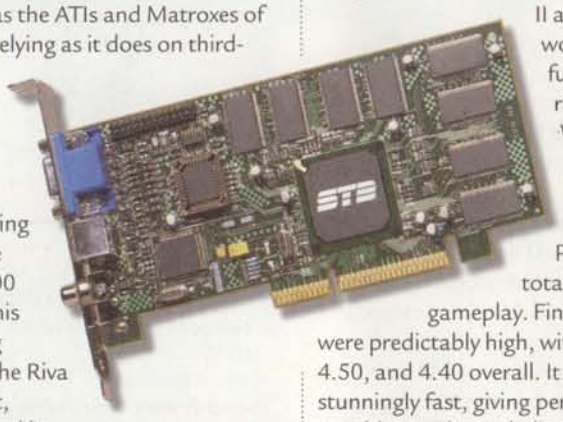
★★★★

Price *£119 (£101 ex VAT)*
Contact *Videologic 01923 260511*
www.videologic.com
Good Points *Quality on a par with a dedicated consumer player. Works with low-end Pentiums.*
Bad Points *Who wants a PC whirring away in their living room?*
Conclusion *If PC-based DVD-Video is what you want, Videologic's solution is as good as any.*

STB Velocity 4400

An excellent graphics card that can push any fast-moving PC game to the limits.

STB has been producing PC graphics cards for quite some time now, although it's fair to say that in recent times it hasn't been as prominent as the ATIs and Matroxes of this world, relying as it does on third-party chipsets rather than designing and manufacturing its own. The Velocity 4400 continues this trend, being fitted with the Riva TNT chipset, manufactured by nVidia. Fortunately for STB, however, the TNT is an absolutely storming performer.



The Velocity 4400 is fitted with 16Mb of VRAM, enough to run a 3D desktop application such as trueSpace at 24-bit, 1,280 x 1,024 resolution with 24-bit Z-buffering.

For the less technical user, all that memory means super-high resolutions in 3D games. But of course, running Quake II at 1,024 x 768 wouldn't be much fun if the frame rate were poor. We tried doing just that and achieved a rate of 30fps on a PII 266, giving totally smooth gameplay. Final Reality scores were predictably high, with a 3D score of 4.50, and 4.40 overall. It really is stunningly fast, giving performance roughly equal to a dedicated Voodoo 2 add-on card. But remember, the Velocity 4400 is a combined 2D/3D card, meaning there's no messing about with video pass-through and no extra PCI slot is required.

The card features a TV-out socket for gameplay via a television. There are drivers for Direct3D and OpenGL applications, and the Windows 95/98 properties panel lets you adjust a comprehensive set of options for both APIs individually. There's no doubt that the Riva TNT is currently the best 2D/3D chipset out there, and the Velocity 4400 uses it to supreme effect.

DAVID FEARON

PCW DETAILS

RECOMMENDED PERSONAL COMPUTER WORLD

★★★★★

Price *£129 (£109 ex VAT)*
Contact *STB 01753 212600*
www.stb.com
Good Points *Superb performance. Comprehensive driver options. TV output.*
Bad Points *A little pricey.*
Conclusion *A good implementation of an excellent chipset.*

Hercules Terminator Beast

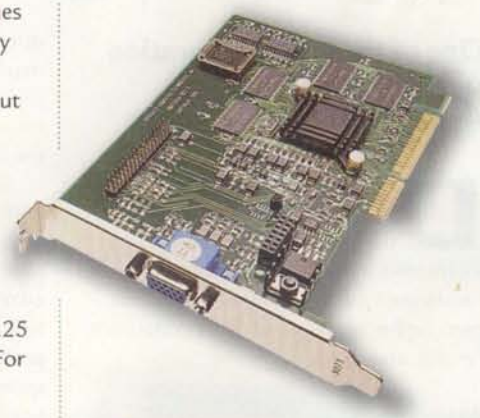
If you're after a graphics card but you're on a budget, this could be one to consider.

The Virge chipset from S3 was one of the earliest graphics card chipsets to sport hardware 3D acceleration. However, it was heavily criticised by gamers for its poor performance. The Savage 3D chipset in the Terminator Beast graphics card is S3's gallant attempt to remove the stigma of the Virge, and to this aim it does well. The Beast has 8Mb of non-expandable SDRAM running at 100MHz. The chipset supports video memory running at up to 125MHz, so the Beast isn't extracting the absolute best from the hardware.

These days, all graphics cards have excellent 2D graphics performance: it is the 3D capabilities and speed that differentiate the best from the rest. On the features front, an interesting aspect of the Savage chipset is support for the S3TC texture compression format which is part of Microsoft's DirectX 6. Games using this texture format can allegedly achieve up to four times better performance on the Hercules card, but none have so far appeared.

The Terminator Beast we tested was sent with the reference drivers from S3: Hercules appeared to have made no major effort to create its own drivers. Even so, it returned a respectable 3D score of 4.25 in our Final Reality benchmark test. For the game Incoming, a non-stop 3D action shooter, the card achieved a frame count of 83fps. Although faster than older cards like the ATI Rage Pro, the Terminator Beast trails behind its contemporaries sporting the likes of nVidia's Riva TNT and 3Dfx's Banshee chipsets. But the Beast is certainly no slouch, and TNT cards in particular are considerably more expensive. The card's 2D and 3D image quality is excellent, and it has motion compensation for DVD playback.

AJITH RAM



PCW DETAILS

★★★

Price *£72 (£59 ex VAT)*
Contact *Acal Electronics 01344 723322*
www.hercules.com
Good Points *Good 2D performance. Nice image quality. Low price.*
Bad Points *3D performance not fantastic by current standards. RAM not upgradeable.*
Conclusion *A good graphics card for those on a budget.*

Let's talk about your future.

Let's talk about Your:)Ware.™

Let's talk about totally new way your PC.

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Your:)Ware™

We can't keep technology from moving forward. But we don't think you should get left behind every time it does. That's why we invented Your:)Ware™. A great new way to always have the latest technology. How? With Your:)Ware, you get to build a computer that's right for you today and trade it in for a new Gateway two years from now. So you're not just getting a computer, you're getting a whole new way to own technology!

Trade-In
The computer we build for you today will still be useful tomorrow because you can trade it in towards a brand new one in two years and every two years after that.‡ How's that for keeping current?

The Right Software
Tell us what you are using your PC for and we'll build it with the right software from our extensive range. Our comprehensive choice offers big savings compared with anything you could buy in the shops.

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Pay in monthly installments using your Gateway Card, and if in the future you need extra software, peripherals or an upgrade, just put the cost on your Card.

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We'll build your PC to meet your needs, using the latest technology, so you get a system designed just to suit you.

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There are two easy ways to qualify for the Your:)Ware trade-in. All you have to do is choose the one which works for you.

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- **Or, if you would prefer to pay for your PC all in one go and still take advantage of the Your:)Ware trade-in option, just buy one of our range of qualifying software titles° along with your new PC.**

intel inside pentium® II

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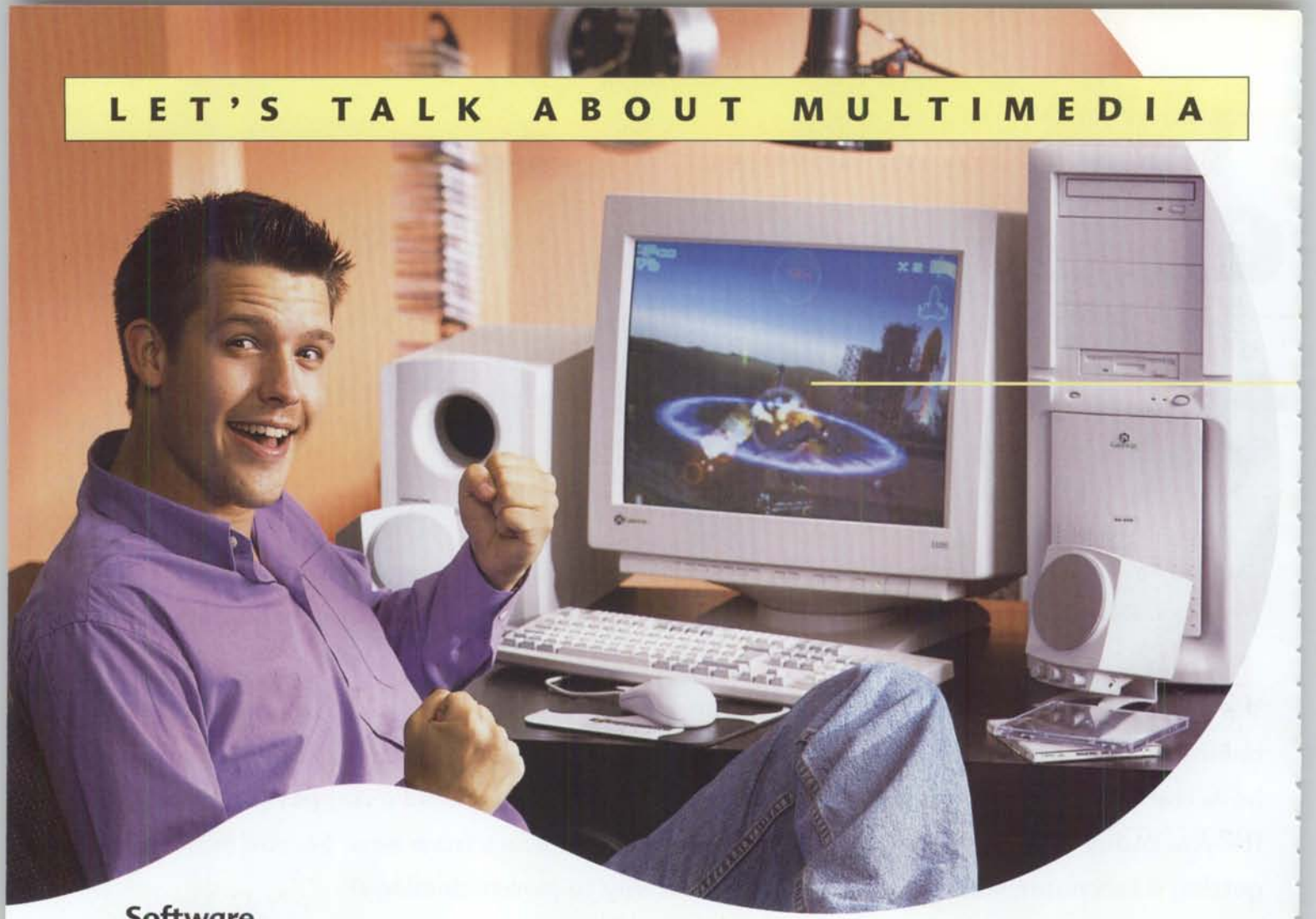
www.gateway.com/uk

LET'S TALK ABOUT MULTIMEDIA



Software

MICROSOFT PACKS

- **†MS Office 97 Small Business Edition 2**
  MS Word 97; MS Excel 97; MS Outlook™ 97; MS Publisher 98; Financial Manager 98 and MS AutoRoute Express 98.
- ****Gateway Arcadia**
  MS Flight Simulator™ 98; MS Age of Empires; MS CART Precision Racing; MS Monster Truck Madness™; MS Golf.
- ****Gateway Source**
  MS Encarta® Encyclopedia 98 (US Version); MS AutoRoute™ Express Europe 98; MS Publisher 97; Greetings Workshop.
- ****Gateway Young Scholar**
  MS Creative Writer 2.0; Scholastics™ The Magic School Bus: The Solar System, The Ocean, The Human Body, In the Age of Dinosaurs; 3D Movie Maker (Nickelodeon).

HOME PACKS

Reference Pack
Encyclopedia Britannica (Britannica); Oxford Reference Shelf (Oxford University Press); Pinball Science (Dorling Kindersley); History of the World 2.0 (Dorling Kindersley); Encyclopaedia of Science (Dorling Kindersley); Chronicles of the Twentieth Century (Dorling Kindersley).
£50 (£58.75 inc. VAT)

Family Pack
Geoff Hamilton's 3D Garden Designer (GSP); Rhodes on ROM (Anglia Multimedia); Visual Home Deluxe (Fasttrak); BMA Family Medical Dictionary (Dorling Kindersley); Family Tree Maker (GSP).
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POWER GAMES PACK

Power Games*
Unreal™ (GT Interactive™); Quake II™ (ID Software™); Forsaken (Acclaim™); Conflict Freespace™: The Great War™ (Interplay™); Motorhead™ (Gremlin™); Battlezone™ (Activision™); Incoming™ (Rage™). **£99 (£116.32 inc. VAT)**

EDUCATION PACKS

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Secondary School Pack
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Your:)Ware qualifying software
* Contents suitable for persons aged 17 and over

Peripherals

Epson® Stylus Photo 700 Colour Printer
The Epson Stylus Photo 700 brings the next generation of professional quality to Home Colour inkjet printing. 6 colour ink technology combined with resolutions up to 1440dpi ensures this is great printer for photo reproduction output and ultra-sharp text printing.
£189 (£222.07 inc. VAT)

Thrustmaster 'Formula 1' Arcade Steering Wheel
From one of the best names in the gaming peripherals market this is a highly popular device for driving games on the PC. It comes with a rubber-enhanced wheel, brake and gas pedals and a gear shift lever. Ideal for all aspiring Michael Schumachers!
£69 (£81.08 inc. VAT)

Sony® Mavica MVC-FD51
A fully portable digital still camera with a built-in 3.5" floppy disk drive. Transferring up to 30 pictures to your PC and sending them to family and friends via e-mail is now cost effective and simple. The camera can be used for up to 2.5 hours, it has a 2.5" TFT display, built-in flash and special picture effects.
£329 (£386.57 inc. VAT)

HP Scanjet 5100C
This scanner is the only scanner that scans photos, text and line art simultaneously. It's easy to install, simple to use and up to three times faster than other scanners.
£176 (£206.80 inc. VAT)

With Your:)Ware™ Jon's always ahead of the game.

The superb Gateway G6-450XL we built for Jon is a serious piece of kit. It's based on the speedy Intel Pentium II Processor, 450MHz, the fastest in the range. It's also got a massive hard drive, crystal clear soundcard and speakers plus a Voodoo2™ 3D graphics accelerator. This system will run Gateway's Power Games Pack with ease, so he can experience the most mind-blowing sound and intense graphics possible this side of the 21st century. Jon had almost as much fun configuring his new system as he does using it, and in two years' time, when he trades it in towards a new Gateway through Your:)Ware, he'll have a whole new range of top components to choose from. Making up his mind between them may even slow him down a fraction.

intel inside pentium® II PROCESSOR

CHOOSE YOUR GATEWAY

G6-333C SE

- Intel® Celeron™ Processor, 333MHz
- 128KB Full-Speed L2 Cache
- Intel® 440LX AGPset
- **64MB SDRAM, expandable to 256MB**
- 3.2GB 9.5ms Ultra ATA Hard Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro Turbo 3D AGP Graphics w/ 4MB SGRAM
- Sound Blaster™ AudioPCI™ 64V
- Altec® Lansing GCS100 Speakers
- 56K Winmodem® – Internal▲
- **15" EV500 0.28dp Monitor†**
- ATX Mini Tower Case
- Choice of a Gateway Software Bundle** Arcadia, Source, Young Scholar

£699 (£821.32 inc. VAT)
FROM £29 A MONTH*(APR 18.9%)
Cash price inc. VAT & delivery £855.40
Credit Limit £870 Loan Value £855.40
38 payments of £29, one final payment of £22.29
Total amount payable £1124.29

G6-350

- **Intel® Pentium® II Processor, 350MHz**
- 512KB L2 Cache
- Intel 440BX AGPset
- 64MB 100MHz SDRAM, expandable to 256MB
- 6.4GB 9.5ms Ultra ATA Hard Drive
- **Toshiba™ DVD-ROM III Drive and MPEG II Decoder**
- *n*Vidia Riva 3D AGP Graphics w/ 8MB SDRAM
- **Epson Stylus 440 Colour Printer**
- Sound Blaster AudioPCI 64D
- Altec Lansing GCS100 Speakers
- 56K Winmodem – Internal▲
- 17" EV700 0.28dp Monitor†
- ATX Desktop Case
- Choice of a Gateway Software Bundle** Arcadia, Source, Young Scholar

£999 (£1173.82 inc. VAT)
FROM £49 A MONTH*(APR 18.9%)
Cash price inc. VAT & delivery £1207.90
Credit Limit £1470 Loan Value £1207.90
30 payments of £49, one final payment of £35.53
Total amount payable £1505.53

G6-450

- **Intel Pentium II Processor, 450MHz**
- 512KB L2 Cache
- **Intel 440BX AGPset**
- **128MB 100MHz SDRAM, expandable to 384MB**
- 10GB 9.5ms Ultra ATA Hard Drive
- **Toshiba™ DVD-ROM III Drive and MPEG II Decoder**
- 16MB STB® *n*Vidia TNT AGP Graphics
- Sound Blaster AudioPCI 64D
- Boston Acoustics® 635 5W Speakers with 15W Subwoofer
- 56K Winmodem – Internal▲
- 17" EV700 0.28dp Monitor†
- ATX Tower Case
- Choice of a Gateway Software Bundle** Arcadia, Source, Young Scholar

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FROM £59 A MONTH*(APR 18.9%)
Cash price inc. VAT & delivery £1560.40
Credit Limit £1770 Loan Value £1560.40
33 payments of £59, one final payment of £35.40
Total amount payable £1982.40

JON'S GATEWAY

G6-450XL

- **Intel Pentium II Processor, 450MHz**
- 512KB L2 Cache
- Intel 440BX AGPset
- **128MB 100MHz SDRAM, expandable to 384MB**
- 13.6GB 9.5ms Ultra ATA Hard Drive
- SuperDisk™ LS-120MB Floppy Disk Drive
- **Toshiba DVD-ROM III Drive and MPEG II Decoder**
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- 56K Full-featured Winmodem - Internal▲
- 19" VX900 0.26dp Monitor†
- ATX Full Size Tower Case
- 105 Keyboard
- Microsoft® Windows® 98, MS® IntelliMouse™
- McAfee Anti-Virus Software, MS Internet Explorer 4.0
- MS Office 97 Small Business Edition 2†† plus MS Encarta® 97 (US version) and MS Money 97

£1799 (£2113.82 inc. VAT)
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Cash price inc. VAT & delivery £2147.90
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Total amount payable £2662.71

These G-Series systems (G6-333C SE, G6-350, G6-450) include: Microsoft® Windows® 98 • MS® Internet Explorer 4.0 • MS Home Essentials 98 ¶(MS Word 97; MS Works 4.5; MS Encarta® World Atlas 98; MS Money 98; Puzzle Collection) • McAfee Anti-Virus Software • 105 Keyboard • MS IntelliMouse™ • 3.5" 1.44MB Floppy Disk Drive

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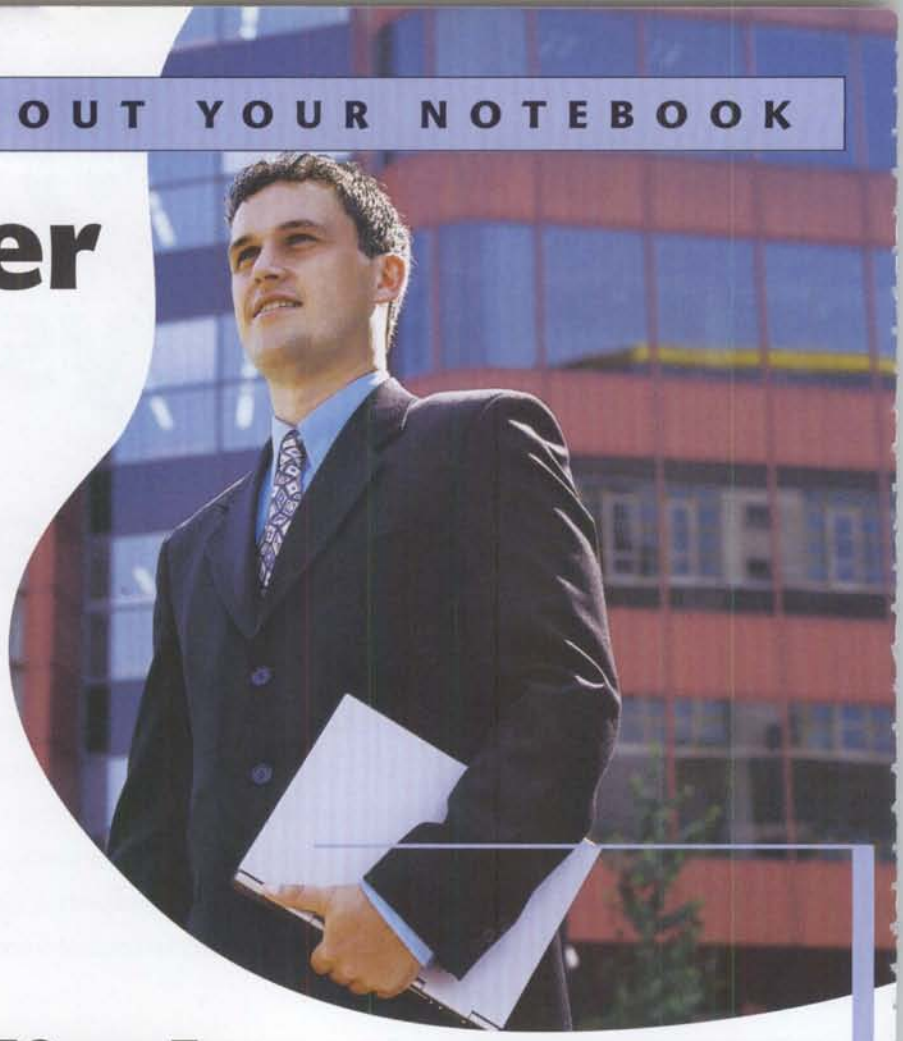
LET'S TALK ABOUT YOUR NOTEBOOK

Mike never thought he'd achieve so much out of so little.



Mike could hardly believe it when we told him we could pack all the normal mainstream notebook functionality into the ultra-size Gateway Solo 3100 we built him. He also couldn't believe it would cost so much less than he thought for a notebook of this quality. It's smaller than an A4 piece of paper, weighs only 2.3kg, yet its Intel Pentium II processor, 233MHz, offers massive processing power. He likes the 12.1" TFT screen, built in CD-ROM and the full size keyboard, while the Lithium battery lets him stay out of the office for hours. As with all Gateway Solo notebooks, we built it to meet his precise needs. Mike says it's true what they say about great things coming in small packages.

intel inside pentium® II PROCESSOR

MIKE'S NOTEBOOK

Gateway Solo™ 3100SE

- **12.1" SVGA TFT Colour Display**
- Intel® Mobile Pentium® II Processor, 233MHz
- 512KB L2 Cache
- Intel® 440BX Chipset, USB Port
- 32MB SDRAM (expandable to 96MB)
- 2.1GB EIDE Hard Drive
- 3.5" 1.44MB Floppy Disk Drive (external)
- **12X min/20X max built-in CD-ROM**
- Neo Magic 256-bit 2.5MB VRAM
- Wavetable Sound with Stereo Speakers
- **8 Cell Lithium Ion 40Whr Battery**
- **Full-Size Windows® 95 Keyboard**
- Portfolio leather case
- **2.3kg - 285 (W) x 215 (D) x 31 (H) mm**
- Microsoft® Windows 98
- Gateway Essentials for Small Business: MS® Word 97, MS Publisher 97, MS Outlook™ 97
- Laplink Software
- Year 2000 Hardware Compliant*

£1549 (£1820.07 inc. VAT)

Business Lease £12.27 weekly*

0800 17 2000

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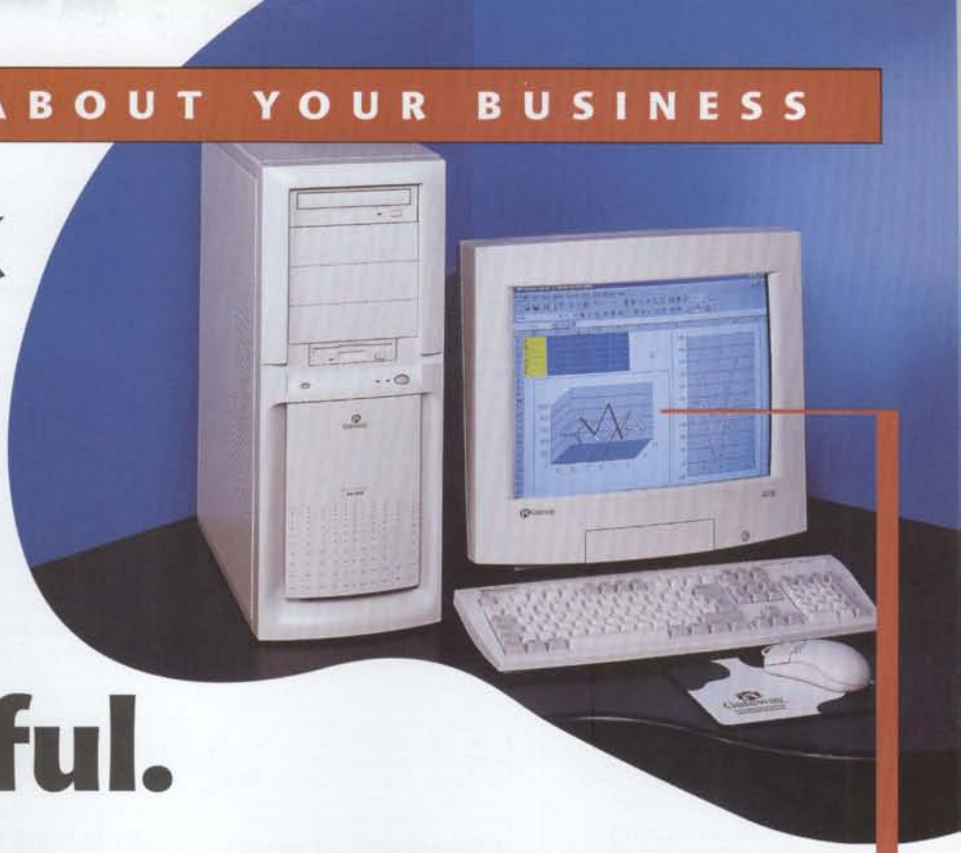
LET'S TALK ABOUT YOUR BUSINESS

Let's talk about being resourceful.



Tell us about your business, and we'll build you a PC loaded with the latest technology and supply the software resources you need as your business grows. Microsoft Office Small Business Edition 2 contains all the basics you need to deal with your everyday communications and spreadsheets. With Gateway Resources, you can write complex documents, do all your accounts and develop business plans. It also contains a useful time management system. Later on, you'll find Gateway Business Showcase just what you need to help you present your business to maximum effect. As you grow and your requirements change, you'll find Gateway fully able to adapt and change with you. Being supportive has always been one of our main assets.

OPTIONS FOR YOUR BUSINESS

GP6-333C

Value Performance Desktop

- Intel® Celeron™ Processor, 333MHz
- 128KB Full-Speed L2 Cache
- Intel® 440LX AGPset
- 32MB SDRAM, expandable to 256MB
- 3.2GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro Turbo 3D AGP Graphics w/ 4MB SGRAM
- Sound Blaster™ AudioPCI™ 64V
- 15" EV500 0.28dp Monitor†
- ATX Mini Tower Case
- 105 Keyboard
- Microsoft® Windows® 98, MS® IntelliMouse™
- McAfee Anti-Virus Software
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 97; MS Outlook™ 97
- Year 2000 Hardware Compliant■

£599 (£703.82 inc. VAT)

Business Lease £4.75 weekly*

GP6-450SE

High Performance Desktop

- **Intel® Pentium® II Processor, 450MHz**
- 512KB L2 Cache
- **Intel 440BX AGPset**
- **128MB 100MHz SDRAM, expandable to 384MB**
- 10GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- ATI Rage Pro 8MB SDRAM 3D AGP Graphics
- Sound Blaster™ AudioPCI™ 64D
- 17" EV700 0.28dp Monitor†
- ATX Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- MS Office 97 Small Business Edition 2✪ plus MS Encarta® 97 (US version) and MS Money 97
- Year 2000 Hardware Compliant■

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State-of-the-art Workgroup Server

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- 512KB ECC **Full speed** Cache
- Dual Processor Support
- **Intel 440GX AGPset**
- 128MB 100MHz ECC SDRAM, expandable to 1GB
- Dual Channel Integrated PCI Ultra 2 SCSI Controller
- Integrated RAID Port III Connector
- 4GB Ultra2 LVD SCSI Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max IDE CD-ROM
- Integrated 2MB PCI Graphics Accelerator
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- 15" EV500 0.28dp Monitor†
- 300 Watt Tower case
- 6 PCI, 1 PCI/ISA Slot
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£99 (£116.32 inc. VAT)

MS Office Small Business Edition2
MS Word 97; MS Excel 97; MS Outlook 97; MS Publisher 98; Financial Manager 98; MS AutoRoute Express 98

▼ When you upgrade to Microsoft Windows NT Server 4.0.
✪ Your:)Ware qualifying software.

Let's talk about what you want.

Now's the time to start browsing through our choice of computers. Here are some example configurations. If there s something you would like to change, just tell us. Our priority is that you are happy with your Gateway. After all, it's going to play a big part in your life for some time to come!

Multimedia PC

G6-350SE

- **Intel® Pentium® II Processor, 350MHz**
- 512KB L2 Cache
- Intel® 440BX AGPset
- **64MB 100MHz SDRAM, expandable to 256MB**
- 6.4GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- NVidia Riva 3D AGP Graphics w/ 8MB SDRAM
- Sound Blaster™ AudioPCI™ 64D
- Altec® Lansing GCS100 Speakers
- 56K Winmodem® – Internal▲
- 15" EV500 0.28dp Monitor†
- ATX Desktop Case
- 105 Keyboard
- Microsoft® Windows® 98, MS® IntelliMouse™
- McAfee Anti-Virus Software
- MS Home Essentials 98♦
- Choice of a Gateway Software Bundle: Arcadia, Source or Young Scholar**
- Year 2000 Hardware Compliant■

£799 (£938.82 inc. VAT)

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Cash price inc. VAT & delivery £972.90
Loan Value £972.90 Credit Limit £1170
31 payments of £39, one final payment of £7.37
Total amount payable £1216.37

Multimedia PC

G6-400

- **Intel Pentium II Processor, 400MHz**
- 512KB L2 Cache
- Intel 440BX AGPset
- 64MB 100MHz SDRAM, expandable to 256MB
- 6.4GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- **Toshiba™ DVD-ROM III Drive and MPEG II Decoder**
- NVidia Riva 3D AGP Graphics w/ 8MB SDRAM
- Sound Blaster AudioPCI 64D
- Altec Lansing GCS100 Speakers
- 56K Winmodem – Internal▲
- 17" EV700 0.28dp Monitor†
- ATX Tower Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software, MS Internet Explorer 4.0
- MS Home Essentials 98♦
- Choice of a Gateway Software Bundle: Arcadia, Source or Young Scholar**
- Year 2000 Hardware Compliant■

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Loan Value £1325.40 Credit Limit £1470
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Total amount payable £1694.90

Professional PC

GP6-350

- **Intel Pentium II Processor, 350MHz**
- 512KB L2 Cache
- Intel 440BX AGPset
- 64MB 100MHz SDRAM, expandable to 256MB
- 6.4GB 9.5ms Ultra ATA Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max 90ms CD-ROM
- NVidia Riva 3D AGP Graphics w/ 8MB SDRAM
- Sound Blaster AudioPCI 64D
- **17" EV700 0.28dp Monitor†**
- ATX Desktop Case
- 105 Keyboard
- MS Windows 98, MS IntelliMouse
- McAfee Anti-Virus Software
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 97; MS Outlook™ 97
- Year 2000 Hardware Compliant■

£779 (£915.32 inc. VAT)

Business Lease £6.17 weekly*

Workgroup Server

ALR-7200

- Intel Pentium II Processor, 350MHz
- 512KB ECC L2 Cache
- Dual Processor Support
- Intel 440BX AGPset
- 64MB 100MHz ECC SDRAM, expandable to 1GB
- Dual Channel Integrated PCI Ultra 2 SCSI Controllers
- Integrated RAID Port III Connector
- 4GB Ultra2 LVD SCSI Hard Drive
- 3.5" 1.44MB Floppy Disk Drive
- 13X min/32X max IDE CD-ROM
- Integrated 2MB PCI Graphics Accelerator
- Integrated Intel PCI 10/100 Ethernet Adapter
- 15" EV500 0.28dp Monitor†
- 300 Watt Tower case
- 6 PCI, 1 PCI/ISA Slot
- 105 Keyboard and MS IntelliMouse
- InforManager Server Management Software
- 30 Day NT™ Operating System Support▼
- Year 2000 Hardware Compliant■

£1499 (£1761.32 inc. VAT)

Business Lease £11.88 weekly*

Notebook

Gateway Solo™ 2500 S5-233SE

- 12.1" SVGA TFT Colour Display
- **Intel® Mobile Pentium® Processor with MMX™ Technology, 233MHz**
- 512KB Pipeline Burst Cache
- 32MB SDRAM, expandable to 160MB
- 2.1GB 13ms Removable EIDE Hard Drive
- **3.5" 1.44MB built-in Floppy Disk Drive and 8X min/20X max 150ms built-in CD-ROM**
- Neo Magic 128-Bit 2MB VRAM
- Wavetable Sound with Stereo Speakers
- **Lithium Ion 60Whr Battery**
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 97; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant■

£1099 (£1291.32 inc. VAT)

Business Lease £8.71 weekly*

Notebook

Gateway Solo 2500 S6-300SE

- **13.3" XGA TFT Colour Display**
- **Intel Mobile Pentium II Processor, 300MHz**
- 512KB L2 Cache
- 64MB SDRAM, expandable to 160MB
- 4GB 13ms Removable EIDE Hard Drive
- **3.5" built-in SuperDisk LS120 Drive and 8X min/20X max 150ms built-in CD-ROM**
- Neo Magic 128-Bit 2MB VRAM
- Wavetable Sound with Stereo Speakers
- **Lithium Ion 60Whr Battery**
- Classic Carrying Case
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 97; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant■

£1849 (£2172.57 inc. VAT)

Business Lease £14.65 weekly*

Notebook

Gateway Solo 5150 S6-233LS

- **14.1" XGA TFT Colour Display**
- Intel Mobile Pentium II Processor, 233MHz
- 512KB L2 Cache
- 64MB SDRAM, expandable to 160MB
- 4GB 13ms Removable EIDE Hard Drive
- 3.5" 1.44MB Modular Floppy Disk Drive
- 8X min/20X max 150ms CD-ROM
- Neo Magic 128-Bit 2.5MB SGRAM
- Wavetable Sound with Stereo Speakers
- **Lithium Ion 50Whr Battery**
- Classic Carrying Case
- MS Windows 98
- Gateway Essentials for Small Business: MS Word 97; MS Publisher 97; MS Outlook 97
- Laplink Software
- Year 2000 Hardware Compliant■

£1579 (£1855.32 inc. VAT)

Business Lease £12.51 weekly*

Notebook

Gateway Solo 9100 S6-300XL

- **14.1" XGA TFT Colour Display**
- **Intel Mobile Pentium II Processor, 300MHz**
- 512KB L2 Cache
- **128MB SDRAM, expandable to 192MB**
- **6.4GB 12ms Removable EIDE Hard Drive**
- **Modular Combo Drive with 3.5" Floppy Disk Drive & 8X min/20X max Toshiba™ CD-ROM**
- Trident 4MB SGRAM
- Wavetable Sound with Stereo Speakers
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Caligari trueSpace 4
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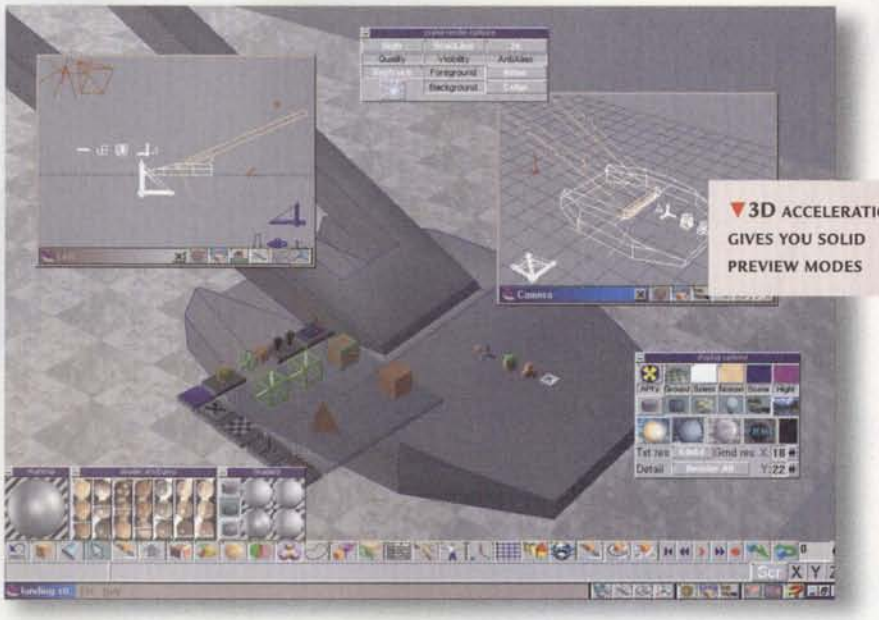


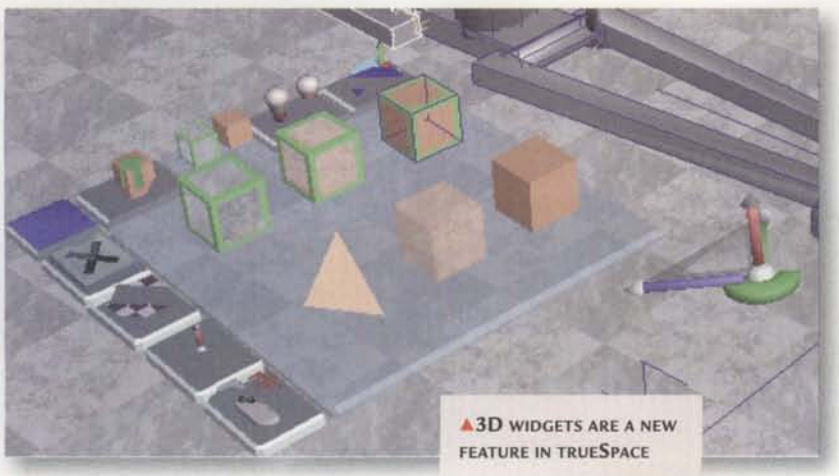
▼3D ACCELERATION GIVES YOU SOLID PREVIEW MODES

Caligari's flagship product has always been at the top end of affordable 3D design and rendering packages. It's accessible to the serious enthusiast but with enough features for the professional to take an interest. Now at version 4, the package displays some impressive enhancements over version 3. Since version 3, however, serious competition has appeared in the form of NewTek's Inspire 3D, the "lite" version of LightWave.

The package now bears the slogan "born to accelerate"; in other words, there is support for OpenGL and Direct3D acceleration, allowing you to work in solid mode in real-time. There are several different modes, including the ability to display solid models as semi-transparent with the wireframe superimposed, a good compromise that really helps prevent disorientation when modelling. Obviously, to take advantage of these features you'll need a 3D graphics card with decent OpenGL support. If you're not blessed with such a device, there's the option of using Intel's 3DR emulation, but this was painfully slow and tended not to update correctly when moving objects around.

There are a significant number of new tools. A fantastically useful feature over version 3, but which was included in the point releases, is area rendering, allowing you to rubber-band a small rectangle of the screen rather than having to calculate the entire scene. This is excellent for tweaking lighting effects that only show up in a final, high-quality render.

This brings us neatly to the most important aspect of any 3D rendering package, the renderer itself. TrueSpace now uses the Lightworks Pro engine from Lightworks Design, which adds a number of features, primarily radiosity rendering. This can significantly increase the realism of a scene, particularly enclosed spaces such as rooms, by modelling the diffuse light reflections from all surfaces, not just direct reflections from light sources. Unsurprisingly, it's very computationally expensive, although a radiosity solution only needs to be calculated once for a given scene if the geometry doesn't change. This solution is then combined with whatever rendering scheme you have selected. Another major augmentation is volumetric rendering, so spotlights in a scene can have a visible foggy beam, great for creating atmospheric effects. Again, however, using volumetric lights greatly increases rendering times. To assist in speeding things up, trueSpace 4 has support for SMP (symmetric multi-processing) under NT. There's no support for network rendering as yet, but then, the target market for this package isn't likely to have a render farm.



▲3D WIDGETS ARE A NEW FEATURE IN TRUESPACE

The Lightworks Pro engine brings with it more sophisticated materials and texturing facilities. There are now more parameters (called shaders) available for basic material attributes: colour, reflectance, transparency and displacement. The displacement shader goes further than basic bump mapping, allowing you to apply procedural-type displacement effects as well as maps. Anistropic reflectance shaders simulate materials such as brushed metal where the apparent colour depends on the viewing angle. To further increase the

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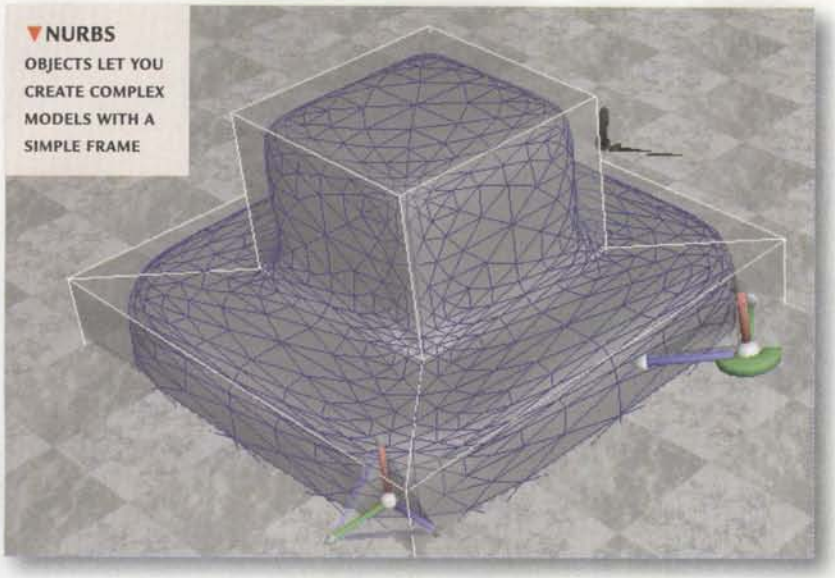


▼NURBS OBJECTS LET YOU CREATE COMPLEX MODELS WITH A SIMPLE FRAME

quality of your finished renders, you can now have multiple layered textures with adjustable transparency. This is an important factor for increased realism and helps reduce that perfect, "plastic" feel: adding layers of grime is one of the best ways to make objects look more convincing, and gives them a sense of scale.

The area in which trueSpace has always excelled is the ease and intuitiveness of its modelling interface. If you can visualise a 3D object in your head, it's incredibly easy to build that object with the minimum of fuss – it beats the likes of Infini-D, Inspire and even 3D Studio Max in this respect. There are a couple of new point editing tools that make the process even easier: you can now select points and faces by dragging a bounding box rather than selecting individually. For even greater control, you can draw a selection lasso around the particular points or faces you want to select, or use the freehand selection tool to keep the mouse button held down and "paint" your selection over an object. As well as these new tools, the basic face, edge and vertex selection algorithms have been tweaked, making them more accurate and reliable and largely avoiding that frustrating syndrome whereby trueSpace refuses to select an edge even though the mouse pointer is directly over it.

To attempt to improve the user interface still further, trueSpace4 features 3D widgets. These take the form of a global properties panel, similar to a standard toolbar but rendered in 3D which sits flat in the workspace, and also context-sensitive tools that will float next to the currently selected object. The idea behind all this is that presenting tools within the 3D workspace makes modelling feel more natural and immersive. I have to say that it didn't work for me; the floating widgets always seemed to be in front of something I wanted to see, and I quickly went back to the standard 2D icons.

Adding layers of grime is one of the best ways to make objects look more convincing

▲A NEW PLUG-IN PROVIDES A MUCH-NEEDED RUBBER-BAND ZOOM FACILITY

NURBS objects are now also fully supported, letting you create complex, smooth-surfaced models given a simple frame object. NURBS objects can be edited interactively, letting you tweak the frame and update the underlying NURBS mesh in real-time. You can then convert the object to a standard polygon mesh, discarding the frame, allowing for normal point editing and manipulation.

If modelling is the area where trueSpace excels, animation is its weakest point. Up until version 3 you needed the patience of a saint to get any kind of results. With the 3.1 release, the key frame editor was overhauled, actually making it usable. With version 4 we finally have spline-based movement and rotation editing, allowing you to fine-tune the velocity and acceleration of animated objects to get movement appropriate to the type of object you're animating.

A related tool is the preview animation option, which runs an animation in the current window in either wireframe or D3D mode, capturing the results to an AVI. This lets you preview the motion as it will appear in the final render. The process of animation is, of course, still a long and frustrating one, and getting the hang of the key-frame system takes an awful lot of practise; in particular, you have to remember that the type of key-frame set depends on the currently selected tool.

The object hierarchy tool is still supplied as a plug-in: it works perfectly well, but integration into the full package would seem a natural step. The particle plug-in supplied with version 3 has gone, to be replaced by a very useful zoom tool, letting you select a scene area to zoom in on with a rubber-banded rectangle. A final gripe is the undo tool, which still seems completely random in what it will and won't undo, and you can never predict how many steps it will let you go back. Frequent incremental saving is the order of the day.

At this price point trueSpace is still the top package around. Although the quality of Inspire's rendering engine is a big factor in its favour, it suffers from the 640x480 animation size limitation. TrueSpace isn't perfect, but all things taken into account, it is extremely powerful and great fun to use.

DAVID FEARON

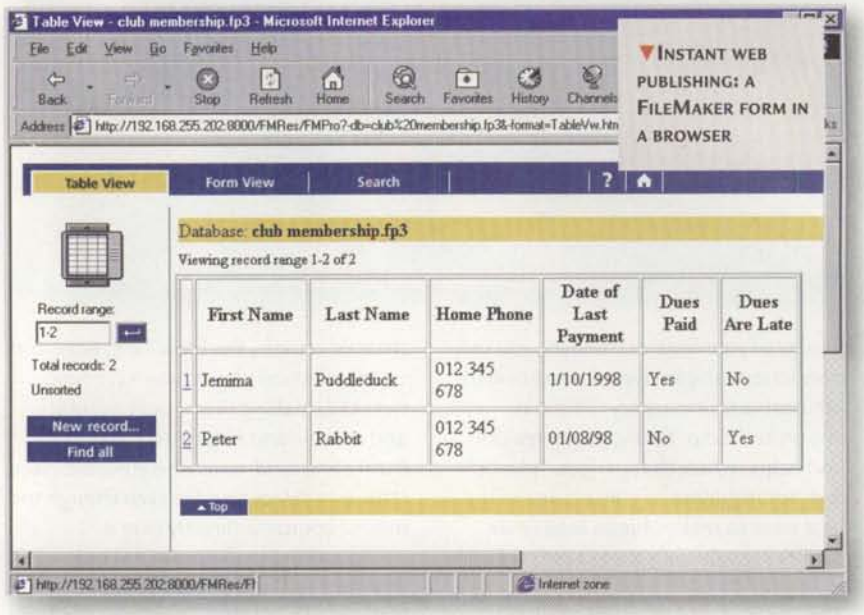
PCW DETAILS

★★★★

Price *£464 (£395 ex VAT)*
Contact *Caligari 0118 982 9826*
www.caligari.co.uk
System Requirements *Windows 95, 98 or Windows NT 4.0, Pentium 120 (Pentium II recommended), 32Mb RAM (64Mb recommended), 20Mb free hard-disk space, VGA Graphics (3D video card recommended)*
Good Points *A wealth of 3D tools, plus comprehensive rendering options.*
Bad Points *Animation is very tricky. The undo tool still seems erratic.*
Conclusion *The best of the mid-range 3D packages is now definitely better.*

FileMaker Pro 4.1
Expert manager

Web-compatible software that's able to keeps tabs on all your data.



INSTANT WEB PUBLISHING: A FILEMAKER FORM IN A BROWSER

FileMaker is the ideal database manager if you are looking for ease of use rather than a vast array of features. That does not mean FileMaker lacks power. It can manage huge amounts of data, works well on a network with up to 25 simultaneous users (a server version can extend this to 100 users), and comes with an integrated, easy-to-use web server for instant web deployment. Check the box for Web Companion, tick the fields and features you want to publish, and point your browser at the web address. Unlike solutions based on HTML export, this is real dynamic access to data, with the ability to modify and delete data. Java-enabled browsers are required.

The main problem with the original implementation of the web deployment feature was the difficulty in modifying or extending the default web forms. The problem has now been largely overcome by Claris HomePage 3.0, a web page designer that includes the FileMaker Connection Assistant. This then creates pages with dynamic links to a FileMaker database, which you can modify and supplement using either HomePage or a HTML editor. All that remains is to copy the site to FileMaker's web folder. HomePage 3.0 comes bundled with FileMaker Developer Edition.

Does a great job of shielding the user from unnecessary complexity

FileMaker does a great job of shielding the user from unnecessary complexity. A good example is that whereas most database managers require you to specify the maximum width of a field and whether you want it indexed, FileMaker does both automatically. Forms, reports and merge letters use essentially the same layout designer. Learn one, and you can use them all. There isn't much in the way of wizards, but you can get a quick start with database design by using one of around 100 templates.

The major new feature in version 4.1 is ODBC import: you can import from an ODBC data source, using a series of dialogues to build a query, and map the fields to a FileMaker database. This is handy, but frankly it is not what FileMaker most needs. It has never been all that difficult to get data from an ODBC source into FileMaker, by first exporting it in a compatible format such as dBase. The challenge is the other way, reading FileMaker data from another application such as Access or Word. Sadly this is still not possible, nor is it possible to link dynamically to an ODBC source, although you can simulate this with scripts that automate the import.

Ambitious users will want FileMaker 4.0 Developer Edition. This includes a facility to create runtime applications that can be freely distributed. There is also a bundle of goodies, including Java classes for talking to the FileMaker web server, and a large range of extra tools and widgets to enhance layouts.

Should you use FileMaker Pro? Well, if your needs lie within its considerable range of capabilities, then it merits serious consideration. Be cautious, though, if you need rich integration with Windows. FileMaker data cannot be read by other applications, and there is no support for OLE automation or ActiveX controls. But the fact remains that you can have a web solution running in an afternoon that would take days using other solutions.

TIM ANDERSON

PCW DETAILS

★★★★

Price *£198.58 (£169.00 ex VAT)*
Developer Edition £458.25 (£390 ex VAT)
Contact *FileMaker 0845 603 9100*
www.filemaker.com
System Specification *PC: Windows 3.1 or higher, CD-ROM, 486/33 with 16Mb RAM. Mac: CD-ROM, System 7.1 or higher with 16Mb RAM.*
Good Points *Easy to use. Highly capable. Instant web publishing. Integration with Claris HomePage possible.*
Bad Points *Cannot read FileMaker data from other applications. No support for ActiveX. ScriptMaker less powerful than languages like Visual.*
Conclusion *The best end-user database manager available.*

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NemeSys GigaSampler
Lifelike sounds

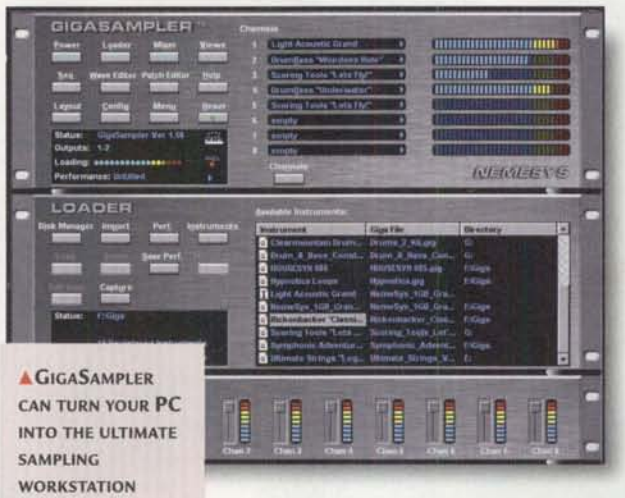
The last word in sampling programs — this one sounds almost like the real thing.

Audio programs like Cubase VST have proved that it's possible to run a virtual studio inside your PC. But there seems to be no stopping the technology there. You can now deck out your studio with software-based effects and equip your PC with dozens of virtual synthesisers — and all achievable without dedicated DSP hardware. So what's coming next? The virtual sampler, of course.

GigaSampler is said to be the world's largest sampler. That's not to say you'll need a warehouse to store it in; it's the biggest because it can handle up to 4Gb of instrument samples in a single session. Until now, professional hardware samplers have been limited to 128Mb of RAM. Although this is more than adequate for most users, it takes something on a much larger scale to accurately reproduce, say, a piano or an acoustic guitar. GigaSampler works by streaming samples off disk in real-time. Using a sophisticated cacheing system, it can deliver up to 64 voices of polyphony with no noticeable audio delays. It also provides 16 MIDI channels for multi-timbral use, supports DirectSound-compatible sound cards, and has more features to offer than the best professional hardware samplers.

The package comes on three CDs and requires 2Gb of hard disk for a full install. This includes around 40 sets of instruments, the best of which is a massive 1Gb Yamaha concert grand piano; most PC sound cards squeeze over 200 instrument samples into just 2Mb of ROM. So what does a 1Gb piano sound like? Let's just say that if you were to listen to a piece of music that was recorded with the real thing, and compared it to GigaSampler, you'd be hard pushed to tell the two apart.

The piano comprises 704 sampled notes, each recorded with full natural decay. This breaks down to eight velocity-triggered samples per key: four with the sustain pedal applied, and four without. The meticulous detail doesn't end there, though. A second set of samples are triggered when you play in a staccato style. This enables each note to "ring" with resonance after a key has been released — just like a real concert grand.



▲GIGASAMPLER CAN TURN YOUR PC INTO THE ULTIMATE SAMPLING WORKSTATION

The range of parameters on offer outstrips what's available on any hardware sampler

The piano is just one example of what can be achieved. In addition to the sampler interface panel, the package includes an audio editor, an instrument editor and a utility for converting Akai CD-ROMs into its native format. There are currently over 300 Akai discs available, containing banks of sounds as diverse as the human voice through to sampled drum loops and orchestral instruments. Additionally, EastWest Sounds one of the major sampling CD producers, is developing optimised sound sets for the GigaSampler.

The interface panel looks and feels like a real rack-mounted sampler and provides access to the more commonly used features. To load an instrument, you simply have to drag a file from the instrument loader onto one of the 16 channels. The 1Gb piano takes just 30 seconds to fire up, much faster than traditional samplers. Playable instruments are created with the instrument editor. Many time-consuming tasks, like assigning samples to key regions, can be automated in seconds using the Wizard tool. The Wizard recognises the pitch of each sample and, depending on the parameters you set, can configure velocity splits, cross-fades and other complex settings. The range of parameters on offer far outstrips what's available on any hardware sampler, and provides some new and very powerful techniques for accurately emulating acoustic instruments.

In use, GigaSampler performed better than I ever expected. The note-on response is very tight and the range of real-time controllers provides unparalleled scope for musical expression. At £425 it may not be cheap, and you will need a fast PC to run it. But if you're looking for the ultimate sampling workstation, nothing comes close to this.

STEVEN HELSTRIP

PCW DETAILS

★★★★

Price *£499 (£425 ex VAT)*
Contact *Turnkey 0171 379 5148*
www.nemesysmusic.com
System Specification *Windows 95/98, Pentium II 233MHz, 128Mb RAM, 6Gb disk with 10ms access time, DirectSound compatible sound card.*
Good Points *Tight note-on response. Breathtaking piano. Reads Akai CD-ROMs.*
Bad Points *Requires a meaty system to deliver its full potential.*
Conclusion *This is the cheapest way to get your hands on a concert grand.*

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Quarterdeck CleanSweep
Deluxe Version 4

An updated version of the professional hard-disk cleaner.

Thanks to an overwhelming disregard by most applications for the value of hard-disk space, there are plenty of uninstaller and clean-up utilities on the market, although none have yet managed to topple Quarterdeck's CleanSweep from the top of the pile. The introduction of CleanSweep Deluxe at the beginning of this year brought with it a host of useful tools to reclaim storage space and the latest version adds a few more to your arsenal, plus support for Windows 98.

Unfortunately, existing users will be disappointed with CleanSweep Deluxe 4 as the new features consist of nothing more than a triplet of utilities that are not integrated with CleanSweep. Fast and Safe Cleanup aims to reduce the time spent on hard-disk housekeeping by looking in five of the most likely locations for accumulated rubbish and automatically deleting it. Internet browser caches get targetted as they can have an unhealthy appetite for disk space. In fact, Netscape Navigator defaults to storing 7.5Mb of web pages before it starts deleting the oldest ones. Browsers keep a record of the links to web pages that have been viewed, so the history records will be removed as well. Cleanup also looks in the Windows Recycle Bin and the Windows/Temp directory, and will search for any lost cluster files. For the last two areas, Cleanup will only delete files that haven't been changed or viewed for the past seven days. You can run Fast and Safe Cleanup at any time or automate the process using a built-in scheduler. This can be set to run Cleanup every time Windows starts up or at set times every few days.

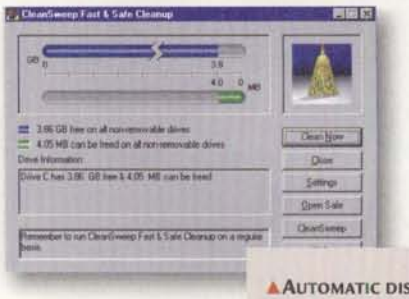
...contains a host of useful tools to reclaim vital storage space

The second utility, Quarterdeck Safe, will protect files that are accidentally deleted and placed in the Recycle Bin. You may, for example, want to make sure that no Word documents or Excel spreadsheets are ever deleted from your system. Select the .DOC and .XLS file extensions from the comprehensive list provided by Safe and it will ensure that those file types are always removed from the Recycle Bin and placed under its protection. You can view the contents of the Safe at any time and restore files back to their original locations. The Safe works hand-in-hand with Fast and Safe Cleanup, so the latter will pass any protected file types over to the Safe instead of deleting them from the Recycle Bin. The Safe also prevents selected files from being removed if the Recycle Bin is emptied, but it won't stop you manually deleting them.

▼STILL THE BEST COLLECTION OF UNINSTALLER TOOLS BUT NO CHANGES TO THE MAIN INTERFACE IN THIS VERSION

Quarterdeck completes the package with its Zip-It utility for creating or extracting archives. This provides pretty much the same tools as the ever-popular WinZip. The main interface looks more basic, but you can select groups of files to be compressed into an archive, use password protection and also create self-extracting executables for distribution. Zip-It replaces the TuneUp AV anti-virus utility that came with the previous version of CleanSweep, and not a moment too soon, as it was too rudimentary to be of any serious use in protecting your data.

The main CleanSweep program sees no changes at all. It runs on Windows 95/98 and Windows NT 4 and provides an array of wizards for safely removing unwanted applications, cleaning up hard disks and modifying the registry. The internet utilities are particularly useful as CleanSweep keeps an eye on browser caches – which, incidentally, is a function duplicated by the new Cleanup tool. It also monitors downloads, removes ActiveX controls and keeps track of cookies – those little data files that web sites place on your hard disk to record your visit.



▲AUTOMATIC DISK SPACE RECOVERY WITH FAST AND SAFE CLEANUP

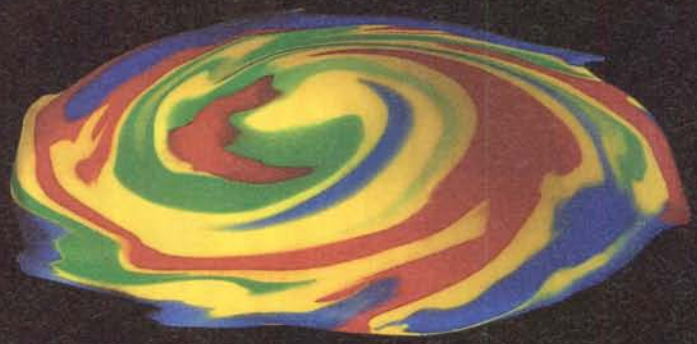
Overall, we can't see much to tempt existing users of the previous version to upgrade, but those yet to invest in an uninstaller and clean-up utility should put CleanSweep Deluxe 4 at the top of their shopping list.

DAVE MITCHELL

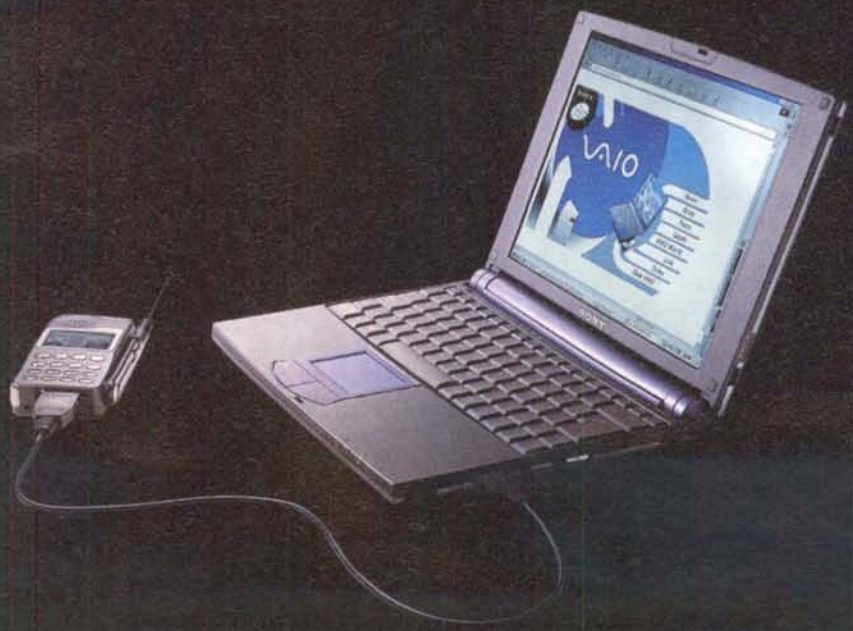
PCW DETAILS

★★★

Price *£46.95 (£39.95 ex VAT); upgrade £23.50 (£19.99 ex VAT)*
Contact *Quarterdeck 0645 123521*
www.quarterdeck.co.uk
Good Points *Easy to use with a superb range of tools to keep hard disks free of unwanted data.*
Bad Points *Not enough new features to justify the upgrade price.*
Conclusion *Still the best uninstaller and clean-up utility on the market.*



was modelling clay **now** angry parrots fighting **by** lee aged 7



was mobile phone **now** web surfer **by** vaio

The Sony VAIO 505FX is a B5 size notebook that weighs just 1.35kg. It features an Intel® Pentium® Processor with MMX™ Technology 266MHz, 32 MB of RAM and a 4.3GB hard disk. Connect it* to Sony's CMD-Z1 Plus mobile phone and, using the bundled 4-in-1 modem card and Phone-Tools software, this notebook becomes something else. A Web surfer. Plug in* our PC-1 digital video camcorder and it becomes a special effects studio. Plug in* our MDS-PC1 MiniDisc deck and it becomes an audio editing suite. And that's just the beginning. Soon, VAIO World will be a place where all our digital products can join together to create new possibilities. All you have to do is open up your mind. And your VAIO Notebook. For further information phone 0990 424 424.

www.sony-europe.com/vaioworld

SONY

*Additional cables required. Sony is a registered trademark of the Sony Corporation, Japan.

VAIO

MapInfo Professional 5.0
Lost and found

If you're trying to find a comprehensive mapping solution, look no further.

If you use Excel, you'll be familiar with MapInfo as it provides the root software for the mapping facility. It's easy to use but limited in scope. MapInfo Professional 5.0 is a top-of-the-line multi-featured package with a claimed 300,000 users worldwide. The guiding principle is that much data has a geographic content which is best digested when displayed on a map. One of MapInfo's subsidiaries, The Data Consultancy, offers datasets on everything from the postcode boundaries of Switzerland to all the parishes of Britain. If you like, you can buy instantly mappable lists of 13,000 UK estate agents and the 10,000 UK pubs for them to go to.

The majority of MapInfo users create their own data. The police, for instance, can map accident spots and health authorities can illustrate geographic concentrations of diseases. The latest version of MapInfo helps this in a number of ways. MapInfo's "continuous thematic shading" means that the display of data is not limited to boundaries such as counties, postcodes or voting districts. Instantly updateable weather maps, for instance, can show sweeps of rain or pockets of sunshine, across the country. New, too, is live access to remote databases. A linked table can be downloaded from a relational database management system like Oracle, Sybase or Access. Users can use these linked tables to rerun queries on a regular basis. After editing in MapInfo, the data in a linked table is saved to the relational database management system in a manner that resolves any multi-editing conflicts. Using MapInfo's spatial indexing you can retrieve points in any database, and Oracle SDO's spatial index is supported, too. Theoretically, this means that as soon as a utility company digs a hole in the road, you could show its location on a street map. This latest version incorporates Seagate's widely used Crystal Reports to simplify the creation of output which goes the other way, converting data shown on the map into well-designed tables. There are also far more cartographic legends indicating buildings, railway tracks, rivers and census tracks. The file translators have been updated, too, so AutoCAD and MSLinks attributes can be imported and exported.

It's easy to perform geographic analyses such as bar charts

A typical map is built up in layers. There might be a raster image layer (digitised pictures) and an automatically co-ordinated vector map of the same location. Details can be imported from a table or drawn on the map. MapInfo sells countless street maps and you can edit them, perhaps to create a fictional location as an illustration. The stacked layers are transparent. One layer may show streets, another towns, another might display shopping centres, and yet another might carry your own legends — but you view them all together. You can also quickly re-plan maps to change sales territories, voter districts and so on. There is even a MapInfo programming language, MapBasic, so you can write your own mapping applications. It's easy to perform geographic analyses such as bar charts of the mileage between towns. The 600-page User Guide is top drawer: bang up to date with the latest version, comprehensively illustrated and well-indexed. In addition, the CD-ROM includes an excellent tutorial which first details how to perform many operations, then offers to run a macro which demonstrates some of them. Despite this help, remember that MapInfo Pro is a complex package and takes some considerable time to master.

THE PACKAGE INCLUDES MAPS FOR THE LONDON AREA IN ITS TUTORIAL

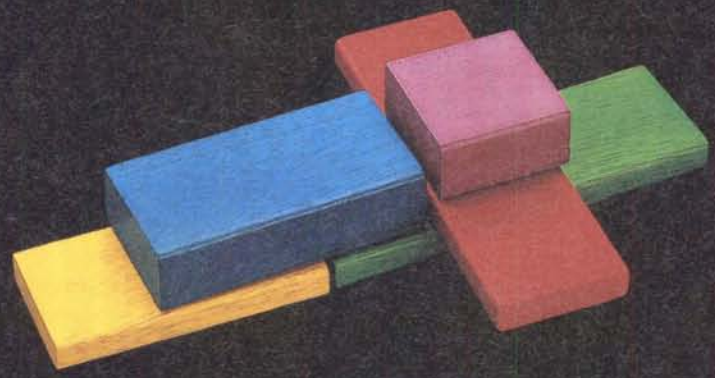
MapInfo also works with Blue Marble Graphics' Geographic Tracker. Ambulances and delivery vans with geographic positioning system (GPS) transmitters can be tracked in real time. GPS Tracking shows a live representation of a vehicle, projected directly on top of a map, while GPS Geocoding will collect field data in real time and log positioning co-ordinates in a variety of file formats, so you can automatically update geographic positions within a spreadsheet or database application.

STEPHEN WELLS

PCW DETAILS

★★★★

Price *£1,287 (£1,095 ex VAT). Upgrade from all previous versions £412 (£351 ex VAT)*
Contact *MapInfo 0175 384 8200*
www.mapinfo.com
System Specification *Windows 95, 98 and NT 4.0, 486 PC with 8Mb RAM, 58.5Mb hard-disk space, plus 31Mb allowance for data.*
Good Points *All you need to make maps. Terrific manual and tutorial.*
Bad Points *Expect to spend a lot of time learning how to use it.*
Conclusion *What an organisation needs to put itself on the map.*



was building bricks **now** alien submarine **by** tim aged 4

was camcorder **now** special effects studio **by** vaio

The Sony VAIO 505FX is a B5 size notebook that weighs just 1.35kg. It features an Intel® Pentium® Processor with MMX™ Technology 266MHz, 32MB of RAM and a 4.3GB hard disk. Connect it* to Sony's PC-1DV Camcorder, using our plug-and-play I-LINK cable, and this notebook becomes something else. A special effects studio. With VAIO's bundled software Picture Gear and DV Gate, you can store and edit recorded images wherever you happen to be. The VAIO will also transform our CMD-Z1 plus mobile phone into a Web surfer and our MDS-PC1 MiniDisc deck into an audio editing suite.* And that's just the beginning. Soon, VAIO World will be a place where all our digital products can join together to create new possibilities. All you have to do is open up your mind. And your VAIO Notebook. For further information call 0990 424 424.

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*Additional cables required. Sony is a registered trademark of the Sony Corporation, Japan.

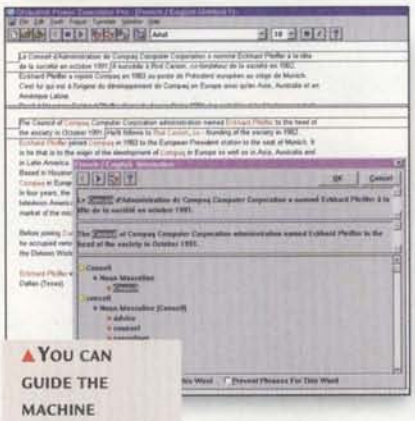
SONY

VAIO

Globalink
Power Translator Pro

A few new features for this established mechanical translation package.

We last reviewed Power Translator Pro in our November '96 issue. It's now at version 6.4 but the core remains the same. The translation engine is based around Globalink's Barcelona translation engine, so its translation abilities remain much as they were before: adequate, but not astounding. No machine translation system can equal that of a human translator, which is to make the translated passage read as if it were originally written in the target language. But Translator Pro does not pretend to be able to do this. Its aim is to produce a rough translation from which you can get the gist of the translated passage or have a better translation made by a professional: starting from a rough machine translation saves the translator time. You can improve the software's performance by translating interactively, guiding the machine to make the right decisions.



▲YOU CAN GUIDE THE MACHINE TRANSLATION TO MAKE THE RIGHT CHOICES

This latest version contains a few extra features. With the addition of Portuguese it can now translate five languages, and there is now more support for web translation. Translator Pro can translate web sites on and offline, and has a chat translation facility. To supplement the main dictionary, there are over 30 specialist versions bundled.

ADELE DYER

PCW DETAILS

★★★

Price *£199.99 (£170 ex VAT)*
Contact *Globalink* www.globalink.com
Good Points *Good for basic translations.*
Bad Points *Translation is not polished.*
Conclusion *With online translation now available, this is a bit of a niche-market product.*

Leisure Pack for Psion
Mobile fun

Have fun on the move. Here's a compelling compendium of on-screen games for the Psion.

There are always moments when nothing hits the spot like a brief burst of Solitaire or Patience... anything except working for a living. To guard against games starvation, consider Widget Software's Leisure Pack for the Psion Series 5, 3a, 3c and Siena, available on disc or flash card. There are seven games in four categories, so there's something to suit every mood. There are two card games, Poker and Solo; two Strategy games, Tetrion and Reversi (aka Othello); an adventure called Castle; and two pub games, Bandit and Chomper. The last doesn't run on the Siena, but the others will. The poker game is straightforward, and Solo is a familiar version of Patience, including a cheat option if all else fails. Tetrion involves blocks descending from the heavens that must be slotted into a solid wall when landing – yes, the name reminded us of something, too. Reversi is the old Windows favourite: a draughts-like game, with four skill levels. Bandit is a fruit machine with grapes, cherries, bells, and so on, while Chomper is an arcade game in the PacMan tradition, with the added attraction that eating a magic star makes you temporarily invincible – ah, if only...

▲BEAT THE BANDIT FRUIT MACHINE — IT'S ALL 'ARMLESS FUN

Castle was our favourite. It's a good old-fashioned text-based adventure game in which you run, walk, jump, climb, examine, unlock, push and drop your way to escaping from the castle. It's like the good-old days of Colossal Cave and it exercises your imagination. You probably didn't buy your Psion to play games on, but at the end of the day, this is £30 well spent.

MARK WHITEHORN

PCW DETAILS

★★★

Widget Leisure Pack
Price *Disc £29.95 (£25.49 ex VAT)*
Contact *01438 815444*
www.widget.co.uk
Good Points *Fun, fun, fun!*
Bad Points *It's not quite Quake II.*
Conclusion *A great time-waster.*

was sand and marble **now** cyclops monster **by** amy aged 4½

was minidisc player **now** editing suite **by** vaio

The Sony VAIO 747 is a notebook with a 12.1" TFT screen. It features an Intel® Pentium® Processor with MMX™ Technology 266MHz, 32MB of SDRAM and a 4.1GB hard disk. Connect it* to Sony's MDS-PC1 MiniDisc deck, and this notebook becomes something else. An audio editing suite. With the included Sony AV playback software, you can title, move, mix and erase your recordings simply by using the 'drag and drop' function. The Sony VAIO also transforms our PC1 digital video camcorder into a special-effects studio and our CMD-Z1 plus mobile phone into Web surfer.* And that's just the beginning. Soon, VAIO World will be a place where all our digital products can join together to create new possibilities. All you have to do is open up your mind. And your VAIO Notebook. For further information call 0990 424 424.

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- PC Card LAN Adapter (10/100) . £149

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£1699.00 £1996.33 INC. VAT	PII-266MMO, 128Mb RAM, 5.1Gb HDD, 24xCD ROM, 14.1" TFT
Agenda	**950EXC**
£1899.00 £2231.33 INC. VAT	As 950 Plus+, NT 4.0, LS-120*, Port Replicator
Agenda	**960EXC**
£1999.00 £2348.83 INC. VAT	As 960 Plus+, NT 4.0, LS-120*, Port Replicator

*On Agenda 950/960EXC LS-120 is supplied in place of, not as well as, the 3.5" FDD. **DVD Drive is supplied in place of, not as well as, the 24x CD-ROM.

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Hi-Grade Axion PRII 266

Tested over twelve months

A model of reliability, the Axion manages to keep the pace at a reasonable price.

It's amazing how quickly things change in such a short time. The Axion PRII 266 made its début in December 1997 and was reviewed in *PCW* the following January. What's changed, you ask? Well, nothing much hardware-wise, but for the £2,000 (£1,996 to be exact) Hi-Grade charged, then you could say lots. Just a year later, this very powerful configuration can be had for around £799.

At the heart of this PC is a Pentium II 266MHz CPU, 32Mb of SDRAM (housed in one of three DIMM slots), Superdisk floppy drive (formerly known as an LS-120), SoundBlaster AWE 64 sound card, Teac 24-speed CD-ROM drive, Maxtor 5.6Gb Ultra DMA hard drive, and an internal Pace 33.6K modem. It is also fitted with an ASUS V3000 AGP graphics card sporting 4Mb of memory. The monitor is a 17in ADI Microscan 5P, which is still a good buy. The verdict after a year is that this PC has held its own. Aside from the fast graphics card that allows for some furious 3D gameplay, it's as reliable as Big Ben. I've loaded and uninstalled so many programs, you'd have expected the magnetic medium to rub off – yet the hard drive cranks merrily away. The original software load and Windows 95 configuration has proved to be watertight and I was only forced to reload Windows after the registry file became disorganised. Like the old Timex ads used to say, "it takes a licking but keeps on ticking", and tick on it does.

DYLAN ARMBRUST

PCW DETAILS

Axion PRII 266

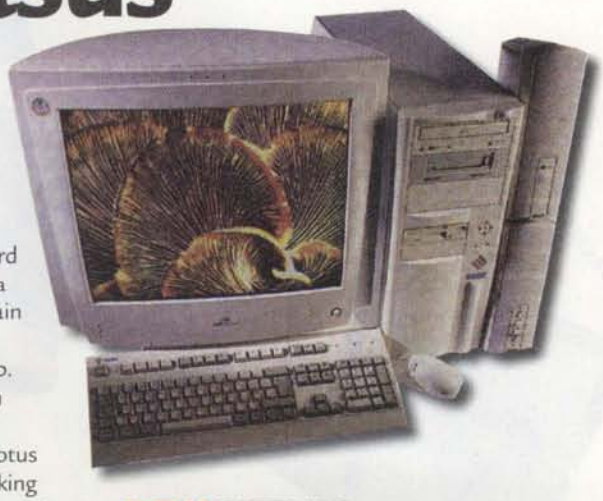
★★★★

Price *£1,996 (£1,699 ex VAT)*
Contact *Hi-Grade 0181 532 6111*
www.higrade.com
Good Points *The LS-120 drive. Excellent AGP graphics card. Sharp monitor.*
Bad Points *Nothing worth mentioning.*
Conclusion *A very reliable PC with lots of spark.*

Mesh Elite Pegasus

Tested over nine months

This PC package has plenty of features to satisfy even the most demanding of users.



Fifteen years in front of a computer have given me a good idea of what is important in a PC, and the reason for choosing the Mesh Elite was that most of the items on my wish list were included. The specification included a 266MHz Pentium II, 64Mb SDRAM, 17in Taxan monitor, fast 24-speed CD drive, Iomega 100Mb Zip drive, 6.4Gb hard drive, Yamaha 3D sound, ATi 3D Xpert@Work graphics card and US Robotics 56K modem. Windows 95 was preinstalled so the only upgrade I required was a wheeled-type Microsoft Intellimouse.

Everything worked properly right away. The machine came supplied with a folder containing all the necessary software and documentation for the installed equipment. The keyboard is good to use and the keys have a good, solid click, but with the main unit on the floor, the cable is overstretched to reach to desktop. The inside of the case is tidy, with plenty of room to expand.
The Pegasus was supplied with Lotus SmartSuite 97, IBM Simply Speaking [*p121*] and PagePlus 5. I spent some time with Simply Speaking, but SmartSuite was no use to me as I am a confirmed Office 97 user. Super-Voice, which is supplied with the US Robotics modem, sets up a useful answer machine. One problem I will be monitoring as the warranty nears its end, is the CD player. It often refuses eject the CD without several pokes, and sounds like a muted dentist's drill.

MIKE EARLEY

PCW DETAILS

Mesh Elite Pegasus

★★★★

Price *Current models start at £1,526.33*
Contact *Mesh Computers 0181 208 4706*
www.meshplc.co.uk
Good Points *Sturdy build. Expandable.*
Bad Points *Mesh's support is "Ring-Back".*
Conclusion *A safe purchase.*

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Taxan CrystalVision 660

Tested over six months

With an excellent picture and user-friendly controls, the Crystalvision was always going to stay ahead of the pack.

In the past year, every monitor manufacturer and their dog have produced flatpanel screens, which in part is why prices have dropped so far and so fast. Flatpanels cost around £2,000 when they first appeared but can now be picked up for around £500. However, only a few of these panels really stand out as being of exceptional quality. Taxan has consistently made high-quality flatpanel displays and the CrystalVision 660 is no exception. Of the many flatpanels I've used, the CrystalVision 660 is probably the best of the lot. The 15in screen runs at a resolution of 1024x768 and takes an analogue input. The screen is clean, crisp and sharp, with even luminosity. While it can only support 18-bit colour, not 24-bit, the colours are still remarkably true. The colours on an LCD are never going to be as good as those on a CRT, but the Taxan is much better than most.

The on-screen display (OSD) is easy to use and has all the controls you could need. Although the auto-adjust button sets up the screen almost perfectly, should you wish to make adjustments yourself, you can easily achieve the best possible picture. There is also a brightness dial on the bottom edge of the screen bezel which links to the OSD, so you can see how far you have turned it. My only gripe is the lack of a dual input for connecting more than one machine to the screen.

ADELE DYER

PCW DETAILS

Taxan CrystalVision 660

★★★★

Price *£1,338.33 (£1,139 ex VAT)*
Contact *Taxan 01344 484646*
www.taxan.com
Good Points *Excellent screen quality.*
Bad Points *Still very expensive.*
Conclusion *One of the best LCD monitors around, worth the steep asking price.*

Viewsonic VP150 Viewpanel

Tested over three months

A flatscreen that outshines old-style desktop monitors, both in terms of looks and picture.

Standalone colour LCD monitors have, until recently, cost more than a notebook with a similar display, largely because they need expensive extra circuitry to adapt signals designed for analogue CRT monitors. VESA's attempt to introduce a standard digital interface has become mired in an industry-wide row. Even so, prices have fallen to the extent that you can buy a high-quality 15in colour LCD flatscreen for under £1,000. Viewsonic's VP150, which I have been using for some three months, costs £998 (inc VAT). That may sound a lot, but bear in mind that a 15in LCD is equivalent to a 17in CRT in terms of viewing area. By comparison, a mid-range 17in NEC P750 CRT, which offers the same maximum 1024x768 resolution at 75MHz, costs £692 including VAT. The VP150 is a joy to use, not least because of the desk space it frees up. Installation under Windows 95 involved little more than plugging it in, and it provides a crisp, flicker-free display. All controls are easily accessible via five buttons on the front, which summon and navigate a menu of options. The screen is easily swivelled to suit your needs and can be hung on a wall.

Viewsonic boasts that the VP150 is the brightest LCD panel on the market, yet this was the one feature that gave me trouble: I suffered alarming symptoms of dazzle at the end of a long day. Otherwise the display gave as good a picture as my CRT, without the hassle of heat and size. Clearly, when prices fall, these devices will wipe old-style monitors off the desktop.

CLIVE AKASS

PCW DETAILS

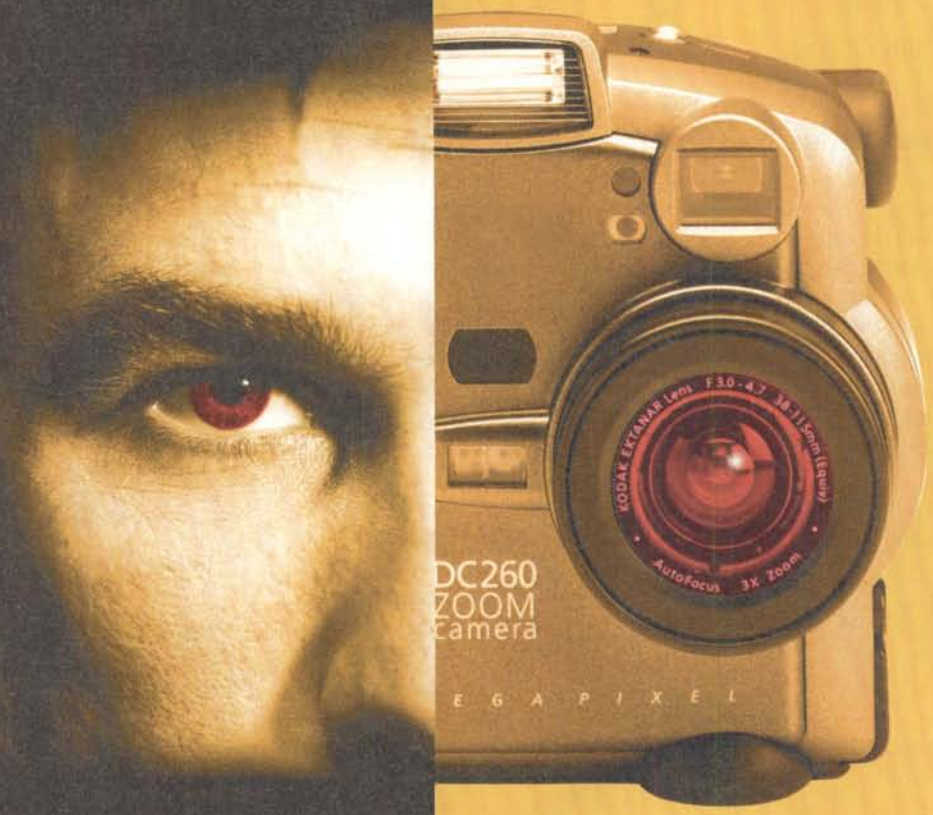
Viewsonic VP150 Viewpanel

★★★★

Price *£998 (£845 ex VAT)*
Contact *MMD (distributor) 01734 313232*
www.viewsonic.com
Good Points *Compact. Good picture.*
Bad Points *Watch the glare.*
Conclusion *Get one if you can afford it.*

Kodak

VISION WITH INTELLIGENCE.....



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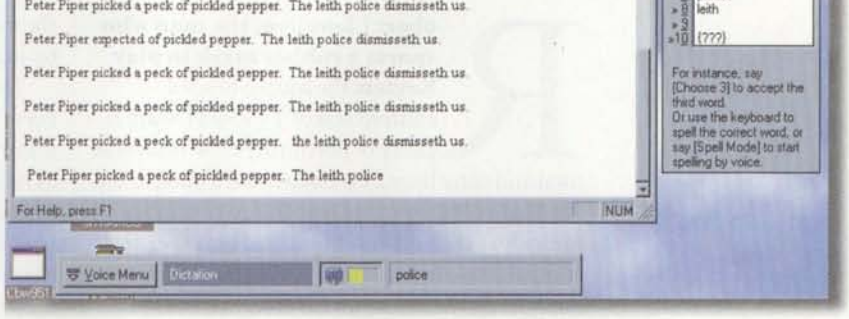
Voicetype Simply Speaking: Home Edition

Tested over twelve months

Software that allows you to speak volumes.

When PCs became available about 20 years ago, I decided not to learn to touch-type because I thought it would soon be possible to dictate directly into the machine. When I read articles about voice recognition programs, it seemed that desktop systems were always five years away. The future finally arrived about two years ago with the appearance of Dragon, Kurzweil and IBM software at affordable prices. My use of IBM VoiceType during the past year has been successful, up to a point, but not without the expenditure of much patience and time.



Speaking is like driving: we all think we do it right. The IBM help notes say that "you do not have to enrol [train the software] if you have a native English accent". I have, so I didn't. The results were rubbish. Not simply gibberish with misunderstood words that changed the meaning of sentences, but rubbish that bore no obvious relationship to what I had spoken. So I read the first 50 enrolment sentences which is "all you need to read if you are a native speaker". This produced some improvement, but not enough to upgrade the script from rubbish to gibberish. I then completed the full enrolment of 200 sentences, "recommended for those who have a foreign accent or a strong regional accent". I'm not proud. This made the program almost usable, but still short of the "over 90% accuracy without enrol" claimed by IBM. It has improved steadily since that time by constant correction and the addition of technical words. The capacity of the system to learn is its greatest strength, and I marvel at the science that underpins it. Recognition is still far from perfect, but the use of VoiceType alongside the keyboard and mouse is, for me, a more efficient and attractive method of working than using the keyboard and mouse alone.

It's ideal for stream-of-consciousness writing where content takes precedence over sense

Using the program is very easy: you speak into the microphone and include formatting commands such as a comma, capital letter or new paragraph, and finish by saying "stop dictation". Correcting words and making additions to the vocabulary are equally simple. A double-click on the incorrect word plays back what you have said and brings up alternatives. If the correct word is listed, this can be chosen and the text will be corrected automatically. If not, then a new word can be typed in and this will be added to the vocabulary.

Mis-matches between the spoken and written words are still depressingly common. One irritation is the frequency with which VoiceType substitutes a proper name for a word that it has not recognised. This suggests that its basic 30,000-word vocabulary contains thousands of names, hence substitutions such as Armagh (for armour) and Satan (for Seaton). The ideal vocabulary would be one that contained every word the user required, and no others. It would therefore be helpful to be able to edit the basic vocabulary. The other principal source of recognition error is minor variations in the microphone set-up. The procedure for maintaining microphone efficiency takes about two minutes to carry out and cannot be recommended enough.

Will the system be useful to you? That depends on how much and what type of writing you do. The hard part of most writing is getting the words out of your head. An accurate VoiceType input rate of 100 words per minute is possible in theory, but this does not solve the problem of thinking time. I would be happy to produce 1,000 words per day, but this is not 10 minutes' work. VoiceType is ideal for stream-of-consciousness writing where content takes precedence over everything else, but then again, most of us use email for that.

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Good Points *Easy to expand personal vocabulary. Potentially accurate when trained.*
Bad Points *Much patience needed for training. Microphone set-up very sensitive.*
Conclusion *Not for everyone.*

Best known as Kryten, the Red Dwarf robot with manic cleaning tendencies, Robert Llewellyn has written a novel about how computer users are perceived. Robert Juman Blincoe finds an enthusiast within the affable android as he tells of his first furtive embraces of technology.

The robot writes back

Robert Llewellyn, the man who sports a rubber mask to play Kryten, the square-headed android star of TV's Red Dwarf, is guilty of portraying *PCW* readers as total and utter losers. He has written a book called *The Man on Platform 5*. Its hero is Ian Ringfold, a camcorder-toting, train-filming, anorak-wearing, computer-loving chap who is transformed into a designer clothes horse for a bet. As part of the deal he has to move in high society and celebrity circles without boring anyone rigid with techie-talk or asking for an autograph.

The reason you should perhaps take offence is because the model depicting Ringfold on the book-jacket is clutching a copy of *PCW* – and you'd be a fool to think this was representing the "after" version of the character. He has been bestowed with the interests and style that go with nerd clichés. So, several erroneous assumptions could be made about *PCW*'s readership – they could do with a makeover; can quote Red Dwarf scenes verbatim; and are intimate with trains, but Llewellyn doesn't intend this. His message is, you can't judge a book by its cover. If you do, you're as guilty of stereotyping as the snobbish, elitist characters inhabiting the book.

The point of the book was to cast a new light on all those clichés about COMPUTER NERDS, SCIENCE FICTION FANS AND TRAINSPOTTERS

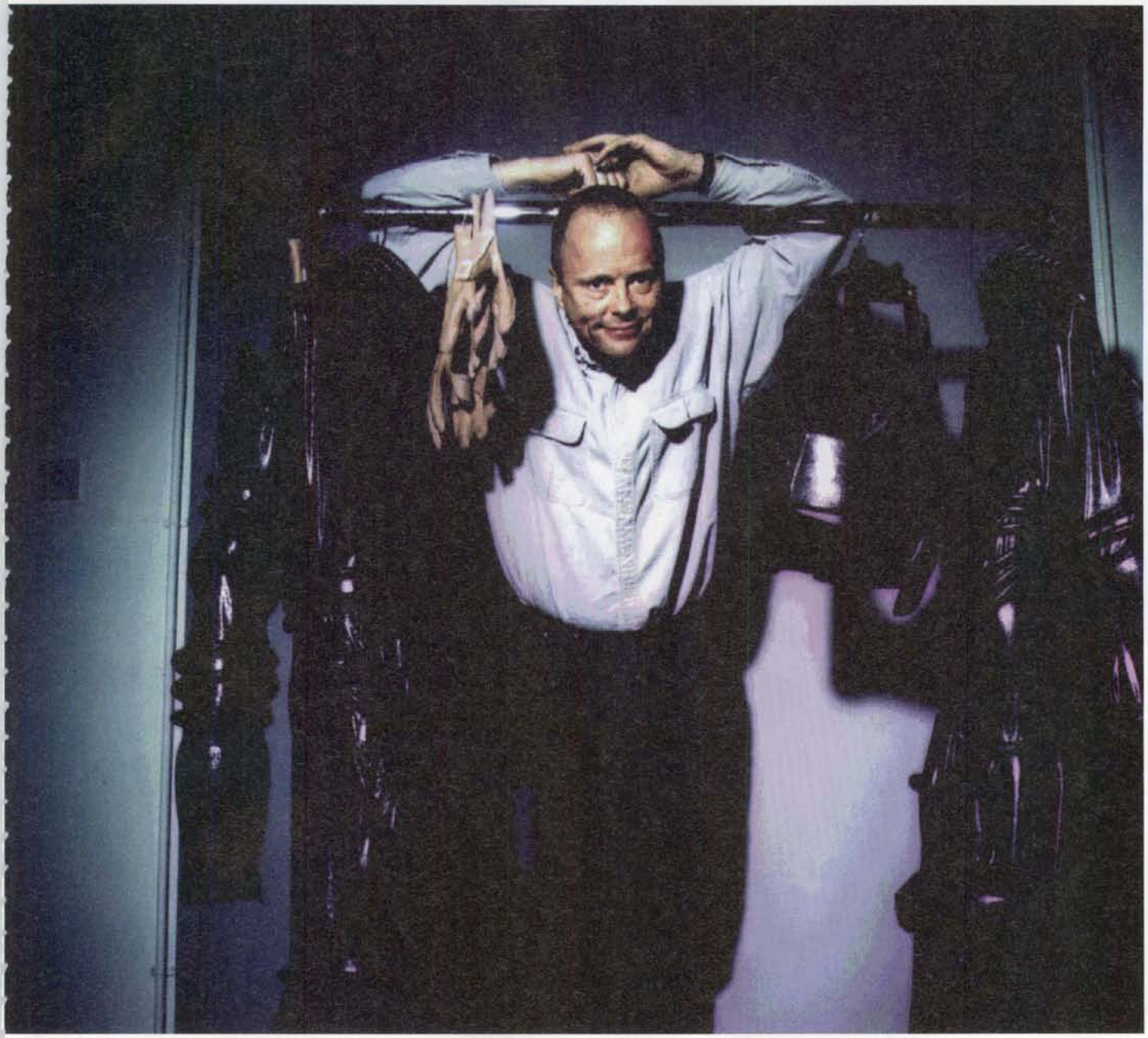
Its plot is a reworking of *My Fair Lady*. In Llewellyn's version we're presented with a man who at first glance is the image of Duane Dibbley, the thermos-carrying *alter ego* of Red Dwarf's ultra-vain Cat. The plan is to turn him into a man with all the qualities of Ace Rimmer, the much admired hero of selected episodes.

"The point of the book was to cast new light on all those clichés about computer nerds, trainspotters and sci-fi fans. It's easy for people in the media to have a go at them – I really wanted to attack that perception," says Llewellyn.

Deciding to have a copy of *PCW* on the book's cover was agonised over for a good five minutes. Llewellyn initially wanted a Mac title as he works in the creative and luvvie world, and so is a fan of the Apple PowerBook. But no-one uses a Mac in the book. So *PCW* was selected in the end: "It's instantly recognisable," explains Llewellyn. "I said to the art director, that's the one you always see in every newsagent."

Llewellyn doesn't feel his book is a generous gesture on his part, in presenting computer lovers or Red Dwarf fans in a more acceptable light for the benefit of the trendy sectors of society. This patronising idea makes his face crack up – literally. "Sorry, I just had to adjust my ear," he says in a muffled voice. He's wearing underpants, socks and his Kryten head, taking a break while filming Red Dwarf 8. The book's elements concentrating on IT reveal he has a strong understanding of what IT can currently do for users, and what he believes it should deliver and how simple it should be to use. It's obvious he feels strongly that technology is not boring and that the shallow, beautiful people are missing out if they ignore the topic due to knee-jerk prejudice. For example, Ringfold spends time explaining his ideas for the front-end of a complex object-based database developed in Unix and utilising Java applets. The user interface is vital, and Llewellyn shows he and his characters are confident about getting their hands on new technology, but want it to be simple and intuitive to use.

Techno-babble is used in his book as a comic device, and as a neat illustration of how enthusiasts use jargon to exclude others and feel more superior to those not in the know. The flip side to this is the speech and manner conventions used by different social classes to achieve the same effect.



Photograph by Nick Dawe

▲ **Robert Llewellyn: part actor, part author, all technojunkie — and proud of it**

Llewellyn's first foray into computers came through his writing. "I use computers all the time. I'm a first-generation word processor user and I've never written on anything else. I learned to write and started writing properly when I got one of those Amstrad green-screen things that made your eyes go weird." Subsequently he's become unafraid of recommending or rubbishing kit he's come across, so his book can be taken on one level as a kind of *Which?* consumer guide.

While making the Channel 4 TV series *I camcorder*, he picked up a lot of expertise about the video-camera market. "I learnt a hell of a lot about cameras and I was just fantasising about the cameras I'd like." The result is advice passed on in *The Man on Platform Five*: don't buy the Sanyo PX 5 S-VHS but get the Canon Hi8 E2 instead.

Ringfold owns a Compaq PC, a US Robotics/3Com 36.6Kbs modem and a Zip drive, and is a keen player of F18 Hornet, version 5. Perhaps worried that if he'd owned a Mac he would not have been as representative of nerdkind, Llewellyn blessed Ringfold with Windows technology, even though he's never used a PC himself.

It was early-shock experiences watching friends navigate DOS that put him off. "I think I was baffled at that pre-Windows stage. I have a very good friend who is a computer programmer. I used to watch him do 'slash slash backslash dot dot E drive'. I thought I'd never get that together." He can't recall where he first came across Apple machines, but felt instinctively that he could understand them. "The operating system did it for me. It was so visual."

Llewellyn shops at Micro Anvika on London's

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Tottenham Court Road, famous for offering examples of cutting edge technology at rock-bottom prices. Micro Anvika is a store well known amongst celebrities, most of whom run Macs. Stephen Fry and Jonathan Ross are regulars, and even cult US film star Harvey Keitel has popped in . The store has sorted out Llewellyn's high-tech needs. Kashif Merchant, Micro Anvika's technical expert who works on Llewellyn's kit, gets a name check in the acknowledgements section: "He's the man who's kept me going when things have gone a bit wonky – which always tends to be my fault."

His first expensive machine was the Apple SE2. Although the kit provided a lot of pleasure and suffered a lot of use, the model's name doesn't trip easily off Llewellyn's tongue – he has the same problem with some of the software he uses. Now he's got a PowerBook, but not having it on his lap makes it difficult for him to recall which model it is. "It's got a colour screen. It's a 3, it's a 3,000... or is it a 320C? Something like that. It's the last generation of new ones. It's not the G3, which is what I'd like to get, which is the new, new one. I think it's a 3200C." What he actually owns is either a 2400C or a 3400. Like Ringfold, Llewellyn isn't above perusing the glossy pages of magazines, checking out the latest add-ons he could buy if he wanted to stall his writing career. "My anxiety is always that if I get too many bits, I'll play with them too much and won't write. Anything else just distracts me, including having a digital camera. I've wasted thousands of writing hours fiddling around with pictures of my kids."

As with other products, he's forthright about the performance of his Nikon CoolPix digital camera. "I have to say I'm not that impressed with it. It does its job for all I want, and it was one of the early ones, as I got it 18 months ago. But I think the lens is not particularly great so you don't get very good results with it. All I see now is really brilliant digital cameras for half the price."

The digital camera was bought to give a visual boost to Llewellyn's web site. This was launched following the demands from US Red Dwarf fans and serves as a vehicle for giving fans the latest news, allowing them to mail Kryten, and as a place to plug Llewellyn's books. "It's a blatant way of using Red Dwarf to launch other things I do," he admits.

Llewellyn embraces internet technology the way web visionaries like Nicholas Negroponte (whose autograph Ringfold has) sees it going. He views himself as a small publisher, and the concept of running his own on-line magazine is what excites him. He's thrilled by the number of hits he's had and the number of emails it has produced. His record is logging on to find 360 unread messages waiting for him. "A lot of people just say they love the show and I don't need to reply." On his web site, he points out that only himself and fellow Red Dwarf actor Craig Charles have email addresses and web pages. "What can I say? I have tried to encourage them [the cast], and I will continue to do so."

Llewellyn loves what internet technology can do for him, and he's prepared to go a certain distance doing things for himself. But there's no point killing yourself cracking HTML programming when you've been good friends with a top technical support chappie since your schooldays. This is Charlie Dancey, who originally scared Llewellyn away from DOS and now gets a nod of thanks in the book for his help. Llewellyn can upload his photos and text and makes a brave stab at page layout. "Charlie tells me what to do. I try and do it. Then he does it, and he does it about 5,000 times quicker than I can."

He [Llewellyn] has felt the TRUE POWERLESSNESS of a man who's taken on technology to improve and share his life, only to have it turn round and bite him

Alongside his PowerBook and his digital camera, the other item that would make it into Llewellyn's high-tech kit bag is 3Com's PalmPilot. He left the shop with it, sharing the sentiment Ian Ringfold expresses in the book and Kryten makes in Red Dwarf: "Nothing smells quite as exciting and special as brand-new electronic items," an observation only someone in love with high-tech gadgets can make. A week later, Llewellyn was brought down from the heady heights his dream purchase had taken him. He read a review telling him he'd got the wrong thing, and discovered it didn't work well with the Claris Organiser on his PowerBook. But he still likes it.

More recently, he's felt the true powerlessness of a man who's taken on technology to improve his life, only to have it turn round and bite him. "The PalmPilot has been absolutely brilliant, until I forgot to replace the batteries about 10 days ago. It wiped everything I had on it. I was using the diary and I had loads of appointments which all went. I know, I know, I wasn't using it properly," he cries, demanding absolution.

Ian Ringfold would have kept his charged. But then, he's a fictional romantic ideal. And he bought a Psion Series 3.

Web site www.llew.co.uk
Email kryten@llew.co.uk

• *The Man on Platform 5 is out now in hardback, published by Hodder & Stoughton, price £14.99.*

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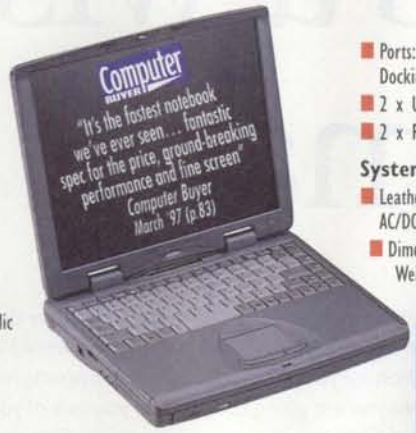

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On these pages, each writer on the *PCW* team has drawn up their list for Santa and selected three (although some greedy hacks wanted four or more!) items they would like to find in their Christmas stocking. The products have been chosen from the various bits of kit that each writer has had the opportunity to get their mitts on, or has dreamt of getting their mitts on, during 1998. So forget the box of soaps or jar of pickled oranges and read on for some of the best technology to buy (or receive) this Christmas.

• *Please note: Each item has been chosen purely on the basis of major desirability!*

Gordon Laing

During 1998 I've been turned on by developments in convergence and mobile communications. Having previously resisted relinquishing my trusty WH Smith narrow-ruled notebooks, I finally took the electronic plunge and I'm now I'm a Psion Series 5 evangelist. Sure, the screen is appalling under poor lighting conditions, but why use it in a dingy room when you could be outside? I've found myself banging out literally thousands of words on that great keyboard while perched on a variety of park benches, and even in my parents' back garden – I wish they'd let me back in for dinner, though.

For mobile comms, Ericsson's SH-888 dual-band phone has built-in hardware which allows it to work straight away with any IrDA-compliant infra-red device, including my Series 5.

In the home theatre DVD is finally beginning to look good, with decent titles employing high bit-rates and anamorphic widescreen. The most promising UK player this year is Pioneer's DV-717 with DTS audio compatibility and RGB on the SCART, due out this December.

Top of my Christmas list, after a naughty all-region modification, is a decent display. The best I've seen is one of Sony's 32in widescreen sets employing the perfectly flat FD Trinitron tube. Some models feature VGA inputs for true convergence.

My final wish is that Santa bullies the Digital TV broadcasters to use higher bit-rates and 5.1 digital surround sound, at least on premium-rate digital movie channels: James Bond should look and sound his best on Christmas Day.

PCW DETAILS

Psion Series 5
Price *around £430*
Contact *Psion 0990 143050*
www.psion.co.uk

Ericsson SH-888
Price *around £159 (inc subscription)*
Contact *Ericsson 0990 237237*
www.ericsson.co.uk

Pioneer DV-717
Price *around £650*
Contact *Pioneer 01753 789789*
www.pioneer-eur.com

Sony 32FD1
Price *around £2,800*
Contact *Sony 0990 111999*
www.sony-europe.com

Nik Rawlinson

I suppose a puppy and a Chocolate Orange are out of the question? Hmmm... I'll have to settle for something more practical, then. A PDA would certainly fit in a stocking, so how about a Cassiopeia E-11? These snazzy pen-based WinCE devices are small enough to fill the palm of your hand, and with an IrDA port on top, transferring data or engaging in two-player gaming is a doddle. Built-in applications include a note taker and sound recorder to keep track of your thoughts while you are on the move. And, all the software available on the net should keep me going until next Christmas.

I reckon I could easily fit a pager into the toe end of my stocking, so for a stylish start to the new year I'll opt for a Zero Zero from Vodafone. Just 6.6 x 4.35cm in size, it will clip on to a belt or slip into a pocket, and, coming in a choice of five stylish finishes, I'll not be shy to get it out in public. Software for paging straight from a PC can be freely downloaded from the Zap! web site, making it even easier for friends to stay in touch.

For my third Christmas wish I'm rather inclined to pick Encarta 99 to while away the long winter evenings and keep me up to date on the things I should know. Instead, though, I think I'll see if I can stretch the open end of the stocking a bit wider and squeeze in a BayGen wind-up radio, just to prove that *PCW* journalists do have a life away from computers. The ultimate green product, less than a minute's winding will give a full hour of aural stimulation.

PCW DETAILS

Casio E-11
Price *£299 (£254.47 ex VAT)*
Contact *Casio 0181 450 9131*
www.casio.co.uk
Vodafone Zero Zero Pager
Price *£59.99 (£51.06 ex VAT)*
Contact *Vodafone 0800 101112*
www.zapit.co.uk
BayGen Radio
Price *£59.95 (£51.02 ex VAT) for the model illustrated here*
Contact *BayGen 0800 731 3052*
www.purleyradio.co.uk/baygen/

Etelka Clark

I can think of nothing better than a machine that you could use not only as a PC, but also as a TV, games arcade, music system and home cinema. A year ago I reviewed a PC that featured all of the above. Equipped with a DVD drive, Dolby surround sound, projector and screen, as well as two DVD movies and countless other pieces of PC software, I remain entranced with the Tiny Home Cinema System. Boy, did I feel sad when I had to give it back! One year on, and nothing else has come close.

I love products that are labelled as one thing but turn out to have a million other uses: the Dorling Kindersley Eyewitness World Atlas falls into this category. Reviewed in our July '98 issue, it calls itself an atlas, but really it contains so much more than just maps. You can learn virtually anything about any country: from economics, resources and environment to tourism, education and politics. You can take narrated "flights", based on satellite pictures, through the skies and above the land from the north coast of Australia to the treetops of the Amazon Basin. Available in both PC and DVD format, this atlas is breathtaking and beats every other.

The best all-in-one deal for Christmas must be the MotoCross Madness bundle. For only £49.99, you get the brilliant, new Freestyle Pro joypad for control with a flick of the wrist, and a copy of the game [*review, PCW December '98*].

One last thing, for those with a Sony PlayStation and a love of Tekken. Don't miss out on the third version, in the shops now.

The graphics have been dramatically improved and there are lots of new characters with whom to battle it out.

PCW DETAILS

Tiny Home Cinema System
Price *£1,409 (£1,199 ex VAT)*
Contact *Tiny Computers 0800 821333* www.tinycomp.co.uk
Eyewitness World Atlas
Price *£29.99*
Contact *Dorling Kindersley 0870 010 0350* www.dk.com
MotoCross Madness and Freestyle Pro
Price *£49.99 (bundle)*
Contact *Microsoft 0345 002000*
www.microsoft.com/games
Tekken III
Price *£44.99*
Contact *Sony 0171 447 1600*
www.sony.com

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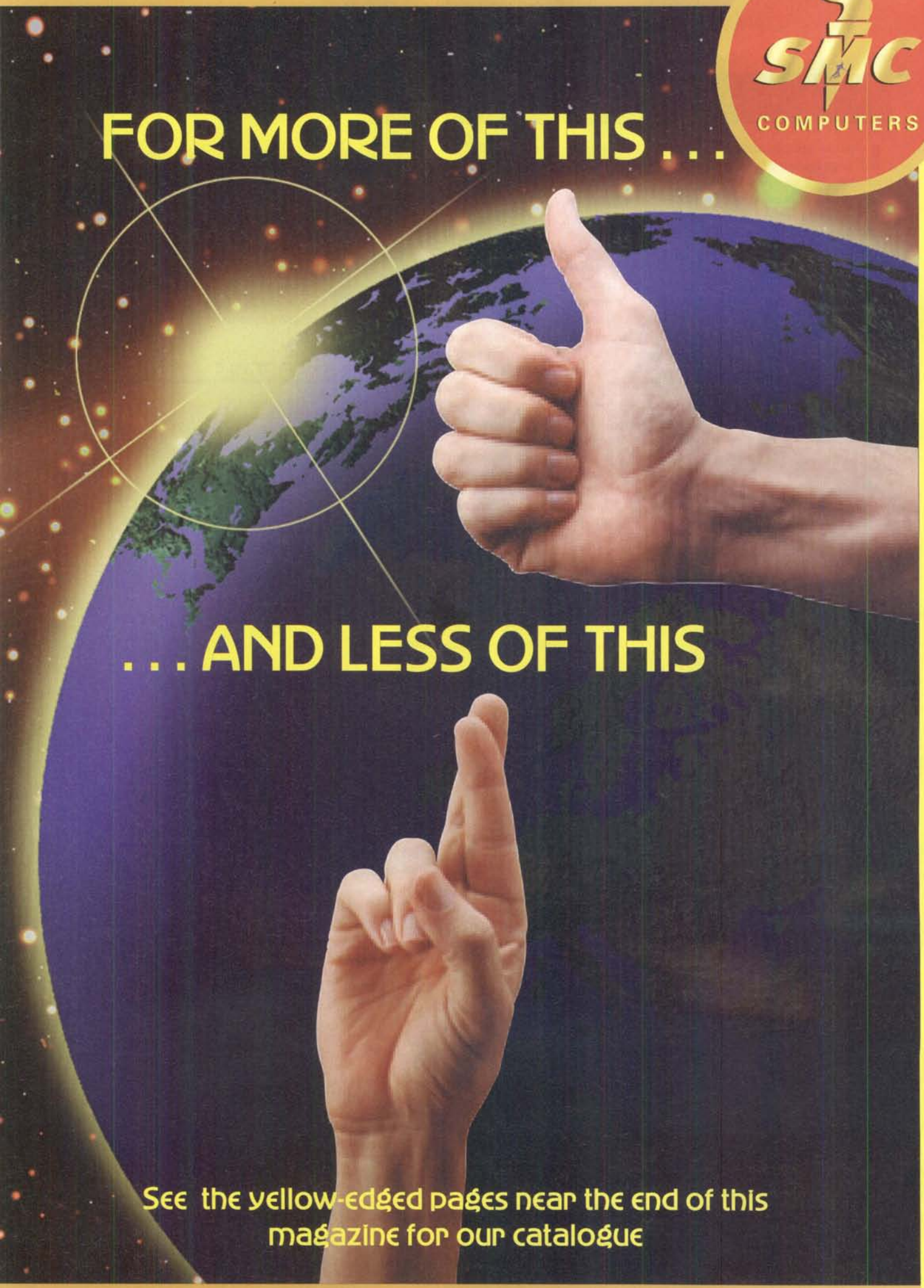


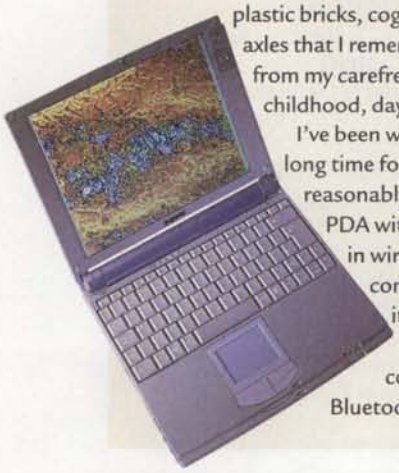
. . . AND LESS OF THIS

See the yellow-edged pages near the end of this magazine for our catalogue

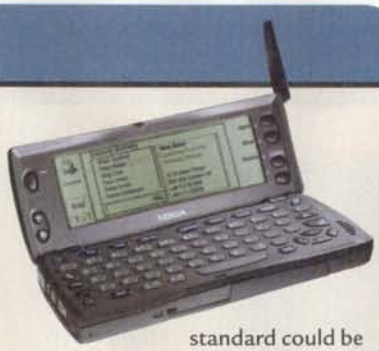
David Fearon

Starting from the unfeasible end of the scale, at the top of my wish list is Sony's gorgeous Vaio PCG-505G sub-notebook. This will be the ideal Christmas gift because all of its silvery bits will reflect the fairy lights and make it twinkle.

Next up is Lego's Mindstorms system. This blends loads of new high-tech bits, including sensor switches and a central CPU that you can program via an infra-red link to your PC, with the good-old knobbly plastic bricks, cogs and axles that I remember from my carefree, childhood, days.



I've been waiting a long time for a reasonably small PDA with built-in wireless comms and it looks as if the coming Bluetooth standard could be the answer to my prayers, but there are no products available yet.



While I'm waiting for a Bluetooth-enabled PalmPilot, the next item on my list has to be Nokia's new 9110 Communicator integrated mobile phone and PDA which replaces the original 9000. It's small enough to be pocketable, it has an embedded 486 processor, and it's a lot more stylish than the old one. Being a Nokia, the phone side of the equation should be pretty good, too.

Finally, I want a Qube microserver from Cobalt Micro. Not so much to use, but to put somewhere prominent and prove to my friends that nerdy things can look cool. In fact, it looks so pretty and it's so small, I could even try hanging it on the Christmas tree.

PCW DETAILS

Sony PCG505G
Price *£2,300 (£1,959 ex VAT)*
Contact *Sony 0870 240 2408*
www.sony.com
Lego Mindstorms
Price *£160 (£136 ex VAT)*
Contact *Lego 0845 606 2043*
www.legomindstorms.com
Nokia Communicator 9110
Price *(Not yet available in the UK)*
Contact www.nokia.com
Cobalt Micro Qube
Price *From £998 (£849 ex VAT)*
Contact *Mintra 0161 256 4030*
www.cobaltmicro.com

Susan Pederson

This year, my Christmas wish list centres on my desire to achieve some style as well as substance. A little more Conran, a little less Courts – you know the kind of thing. Number one on my must-have list is the Mitsubishi Pedion, a devastatingly stylish notebook that is a mere 18mm thick and weighs1.45kg. The 266MHz MMX Pedion has a 13.3in TFT screen, 64Mb RAM and a 1Gb hard disk, as well as an optional "media pack" docking station with 20X CD-ROM drive and floppy drive. Santa will have to have deep pockets to buy this slimline beauty.

The Pedion will be appearing in the *1999 Guinness Book of World Records* as the thinnest notebook ever, but I wouldn't want it to appear anywhere except on one of these lovely desks (*illustrated, below*) designed by graduates from Parnham College. Prices for their modern, practical workstations start at £1,100. Sadly, I'll have to buy a new flat that's good enough to house such lovely furniture.

Once the removal men have cleared out and the dust has settled, I'll need only one other piece of equipment resting on my minimalist worktop: the Olympus C-1400L. At the price, it's not exactly the cheapest digital camera around but feels great in the hand and gives high-quality results. The C-1400L has a 3X zoom and the equivalent of a 36-110mm lens on a 35mm camera. It also provides resolutions of up to 1280x1024.

Oh, and while the Bewhiskered One is at it, he might as well throw in a copy of the fiendishly addictive Worms II, as well. So cute, so pink... so evil. For only £29.99, Worms is a positively cheap way to spend the holidays – and a girl's got to have some fun, after all.

PCW DETAILS

Mitsubishi Pedion
Price *£2,349 (£1,999 ex VAT)*
Contact *Mitsubishi 0800 212422*
www.mitsubishi-computers.com
Parnham College computer desks
Price *From £1,100*
Contact *Parnham College 01308 862204*
Olympus C1400-L
Price *£1,526 (£1,299.99 ex VAT)*
Contact *Olympus 0171 253 0513*
www.olympus.com
Worms II
Price *£29.99*
Contact *Team 17; 01924 267776*
www.worms2.com

Adele Dyer

My mother always told me I ought to marry a rich man, and sorting out my Christmas wish list, I realise she was probably right. I have *very* expensive tastes.

It's time to soup up my PC. I need a new processor, a larger hard disk, an upgraded motherboard, case and RAM... OK, a new machine. But if I'm upgrading, then I'd like an LCD screen: no more flicker, no wasted space, and it's much easier on the eye. The lovely 18in Eizo FlexScan L66 would fit the bill nicely.

While I'm at it, I'd really like a thin, light-weight notebook. Like everyone else in the *PCW* office I was impressed by the Sony PCG-505G, but then again, the HP Sojourn and the Mitsubishi Pedion also caught my eye, as did the Digital Ultra Hi-Note 2000, now called the Compaq Armada 6500. All are very slim without sacrificing usability.

A digital camera features high on my list and the latest Kodak DC260 Pro would be perfect. It costs £900, but it has a very high resolution (1536x1024) and comes with a wealth of features. Or, if Santa is feeling mean, I could make do with Kodak's DC200 for only £300.

Finally, I will have Microsoft Money 99 to help me keep track of all the money I'll be spending this Christmas.

PCW DETAILS

Compaq Armada 6500
Price *£3,954 (£3,395 ex VAT)*
Contact *Compaq 0845 270 4000* www.compaq.co.uk

Eizo FlexScan L66
Price *£2,784 (£2,369 ex VAT)*
Contact *PDS 01483 719500* www.eizo.co.uk

Hewlett-Packard Sojourn
Price *£3,230 (£2,749 ex VAT)*
Contact *Hewlett-Packard 0990 474747* www.hp.com

Sony PCG-505G
Price *£2,300 (£1,959 ex VAT)*
Contact *Sony 0870 240 2408* www.sony.com

Kodak DC200 / Kodak DC260
Price *DC200: £300 (£255 ex VAT). DC260: £900 (£767 ex VAT)*
Contact *Kodak 0800 281487* www.kodak.co.uk

Microsoft Money 99
Price *£49.99 (£42.54 ex VAT)*
Contact *Microsoft 0345 002000* www.microsoft.com/uk

Clive Akass

Last year's crop of mini-notebooks changed my mind on mobile design. None had a keyboard better than the Psion Series 5 handheld's, and not one could be pocketed, so what was the point of making them so small? Far more important is to have a device light enough to carry, with easy input and a reasonable battery life. Which is why I fell instantly in love with Sony's Vaio PCG 505G. It weighs barely more than a paperback and slips easily into a shoulder bag. So yes, Santa, I want one, I want one.

My second choice is a Kodak DC260 Pro digital camera. It has a 1.6 megapixel sensor and a 3X zoom (6X with a digital extender), a USB port for quick downloading, and scripting capability. A burst mode allows up to eight pictures to be taken in rapid sequence (many digicams require half a minute between shots). The 260 comes with two 16Mb flash cards, but I think Santa should throw in a few more.

My third present is a cheat, as it's really three in one. Fender, Roland and Cakewalk have collaborated on developing MIDI guitar software and hardware. Fender has launched its Roland Ready Stratocaster, fitted with a Roland GK-2A pickup which can be switched between MIDI and standard mode. This just happens to need a Roland GI-10 MIDI-conversion box. It takes other pickups but Roland says tracking is best with the GK-2A. The nice thing about the GI-10 is that it will take a mic input, too: plug it into your sound card and you can sing with the sound of a thousand violins.

PCW DETAILS

Fender Roland-Ready Stratocaster
Price *£599.95 (£510.60 ex VAT)*
Contact *UK dealer Arbiter 0181 202 1199* www.fender.com

GK-2A / G1-10
Price *GK-2A: £136 (£115.74 ex VAT); £99 (£84.25 ex VAT) for an internal fitting. GI-10: £440 (£374.47 ex VAT). But check out a bundling deal.*
Contact *Roland 01792 515020* www.roland.co.uk

Kodak DC 260 Pro
Price *£900 (£767 ex VAT)*
Contact *Kodak 0800 281487* www.kodak.com

Sony PCG505G
Price *£2,300 (£1,959 ex VAT)*
Contact *Sony 0870 240 2408* www.sony.com

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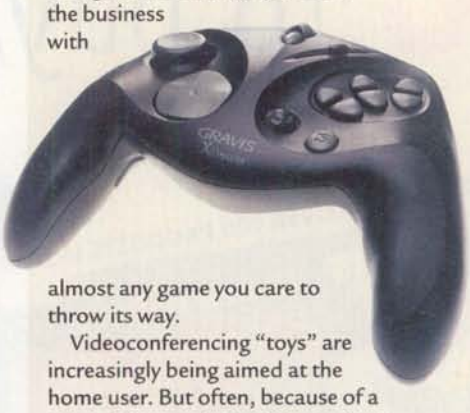
Dear Santa...

Paul Trueman

'Twas the night before Christmas when all round the house, not a thing stirred... apart from the sound of me blasting the living daylights out of everything with my Gravis Xterminator! The first present on my wish list transformed my game playing when I reviewed it, and offers everything the joystick-weary gamer could wish for. Digitally programmable, an ergonomic dream, plus enough buttons with which to kick intergalactic butt, this pad does the business with almost any game you care to throw its way.



Videoconferencing "toys" are increasingly being aimed at the home user. But often, because of a poor picture and poor frame rate, it isn't a good idea to get one. However, a couple of Kodak DVC323s would do very nicely, thank you very much. This great, affordable camera is the business if, in the words of Billy Baldwin in the film *Sliver*, "you like to watch." It's a dream to set up, it uses the snazzy new USB port, and the picture quality is surprisingly impressive, given its price.

My final choice is the most fanciful. A Sega DreamCast. Yes, yes, they're just out in Japan (November) and, fingers crossed, they'll be out in the UK next September. All the suckers might be buying PlayStations at knockdown prices, and good luck to 'em, but the Sony console is yesterday's technology and the price has only been reduced because Sony is milking the last of its cash cow. The DreamCast will be three times more powerful than even the latest arcade machines, and Sega has shown that it has learned from the lessons of the disastrous Saturn. The trip over to Tokyo to buy it, of course, will be the icing on my Christmas cake.

PCW DETAILS

Gravis Xterminator
Price *£39.95*
Contact *Gravis 0800 252359* www.accoeurope.com
Kodak DVC323
Price *£159.99 (£136.16 ex VAT)*
Contact *Kodak 0800 281487* www.kodak.com
Sega Dreamcast
Price *Out now in Japan at Y29,800 (£146). Due out in the UK Sept '99*
Contact *Sega* www.sega-europe.com

Ajith Ram

I'd like a little Marvel for Christmas. This all-in-one entertainment solution is built on Matrox's 128-bit chipset. It's an excellent 2D/3D graphics card which turns into a video capture card. Users can plug their VCRs and camcoders directly into Marvel's breakout box to capture full-screen video in MJPEG format, and edit it using the bundled Avid Cinema software. There is a built-in TV tuner and motion compensation for DVD playback, too.

Also on my list is the SoundBlaster Live! sound card. Built around the EMU 101K chipset, the SB Live! is a tremendous improvement over other sound cards. Due to its powerful processor, it can support up to 512 MIDI voices simultaneously. It also handles 32 DirectSound 3D streams in hardware and has its own API, called Environmental Audio Extensions, which helps games developers add realistic sound effects. The card comes with a good collection of music-editing software and a copy of the popular game, Unreal.

My stocking is nearly full, but there's room enough for the Wicked 3D Voodoo2 graphics card. While other Voodoo2 cards are limited to a resolution of 800x600, the Wicked 3D board supports resolutions up to 1024x672. If two Wicked 3D boards are put together in SLI mode, the resolution rises to 1280x1024. It supports WickedVision, too, so when used with stereoscopic glasses, WickedVision transforms most Direct3D, OpenGL games into true holographic ones. The Wicked 3D board is the fastest Voodoo2 card in Direct3D applications.

PCW DETAILS

Marvel G200
Price *£199 (£169 ex VAT)*
Contact *Matrox 01753 665533* www.matrox.com
SoundBlaster Live!
Price *£149 (£126 ex VAT)*
Contact *Creative Labs 01245 265265* www.sblive.com
Wicked 3D Voodoo2
Price *£139 (£118 ex VAT)*
Contact *Henderson I.D; 01256 333975* www.wicked3d.com

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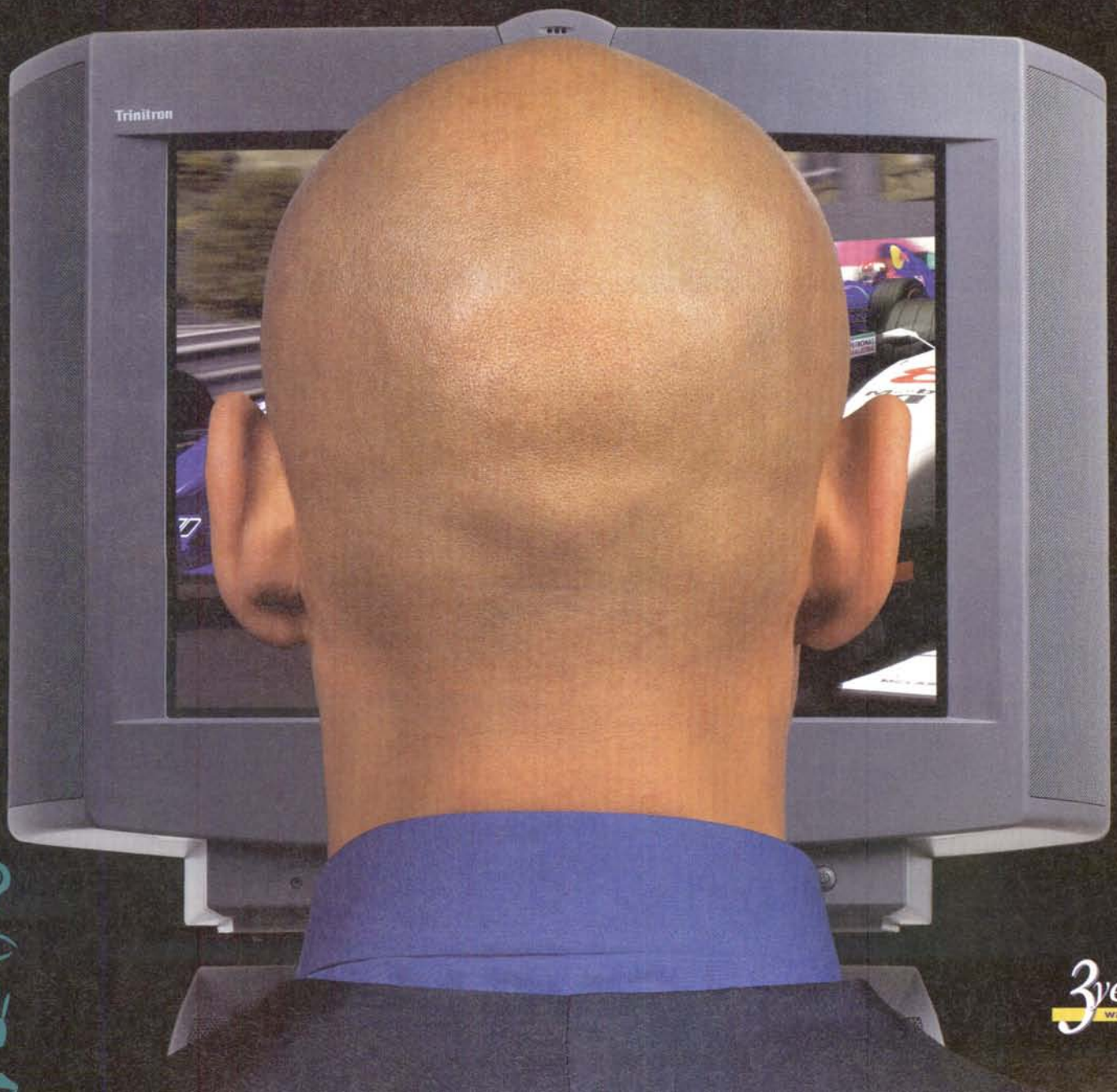

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- TV Out (PAL and NTSC)
- Zoomed Video Support
- Intergrated Synaptics Touchpad with 2 buttons
- 12 Cell (65 W/Hr Lithium Ion Battery)
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- Lithium Ion Battery
- Microsoft Home Essentials 98***

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Christmas crackers

Why seek out three kings of Orient when you can take wise advice from us? Ajith Ram tests 12 PC systems for games, office or home, some at prices that won't sleigh you.

Christmas is that time of year when many people consider treating themselves and their family to a new PC. There's a wealth of choice and specifications around, so we have divided our group test into three categories to help you find exactly what you want.

The first category includes four games systems. As this is a season when there's more time available in which to play games, and the largest number of games titles are released, it makes sense to test a few machines which could fit the bill as a "perfect" games machine. Our specification included a powerful graphics card, large monitor, good sound card, speakers and games bundle, for a cost of around £1,500 (inc VAT).

Our second category is made up of mid-range systems that will run office applications, an accounts package and multimedia programs and which can be used to surf the net. In other words, the family PCs. For around £1,000 (inc VAT) we asked that these systems be equipped with a good graphics card, sound card, speakers and a decent monitor.

Our third category consists of the budget-priced PCs. Typically costing around £700 (inc VAT) these economically priced systems are good for those on the lookout for a second home PC and are a good choice for college students on a tight budget. We weren't looking for flashy extras, just good, solid components at a fair price.

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Illustration by Mark Hudson

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ARMARI MBX-450
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PCW November 98

EDITOR'S CHOICE PERSONAL COMPUTER WORLD Technical Support

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"Best level of technical knowledge displayed by any help desk... the Armari help desk was the fastest to answer our call"

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Armari NBX-350 95

Games system

This machine has the same powerful graphics card as the Carrera system [*below*]. Housing the Riva TNT chipset, the Diamond Viper V550 supports Microsoft's DirectX 6 API and is the fastest 3D accelerator on the market [*PCW November '98, p198*]. With 16Mb RAM, the Viper card can handle resolutions up to 1920x1600 and is supported by a 350MHz PII processor. The Armari system has a Creative Labs DVD-ROM, but the MPEG-2 decoding is handled by the processor and Zoran's software DVD player. Since the Riva TNT chipset does not support motion compensation, the software playback may result in dropped frames. Audio is provided by Diamond Multimedia's Sonic Impact S90. Based on Aureal Semiconductor's Vortex chipset, the S90 is a true gamer's card. Supporting Aureal's proprietary A3D API and Microsoft's DirectSound, it is one of the few sound cards able to reproduce true surround-sound using just two speakers. The A3D API is supported in popular games.

The NBX-350 is housed in one of the largest tower cases we have seen, making its interior seem tidy and spacious. The Asus motherboard has two PCI slots free. There are also two 3.5in and 5.25in bays free, making the system easy to upgrade. The 9.1Gb hard disk is big enough to cope with demanding desktop storage requirements.

The Armari's performance in our SYSmark test was above average. Its Final Reality test results were equally good, due to its powerful graphics card.

The 17in Iiyama S7029T monitor supports resolutions up to 1600x1200 but here it has a lower refresh rate than the ADI 5GT monitor. It provides sharp images and crisp colours and the controls are easy to manipulate.

PCW DETAILS

Price *£1,498 (£1,275 ex VAT)*
Contact *Armari 0181 810 7441*
www.armari.com
Good Points *Powerful graphics card. DVD-ROM.*
Bad Points *Average speakers. No hardware MPEG-2 decoder.*
Conclusion *A good gaming system that is easily upgradeable.*

Build Quality	★★★★
Performance	★★★★
Value for Money	★★★
Overall Rating	★★★

Carrera Power Pro 2-450

Games system

Built around Intel's 450MHz processor, the Power Pro is the fastest system in this group test with a SYSmark test score of 181. The heart of a games PC is the graphics card. The Power Pro delivers its knockout punch through the Diamond Viper V550, *Editor's Choice* in our November '98 graphics card group test. Built around nVidia's new Riva TNT chipset and boasting a fill rate of 180 million pixels/sec, the V550 is faster even than a dedicated 3D accelerator like the Voodoo2. The Riva TNT (TwiN Texel), as its name implies, is able to read two pixels in a single clock cycle. This gives it an advantage in games, now coming on to the market, which utilise multi-texturing. The high fill rate also gives the V550 the ability to deliver smooth frame rates. A graphics card with such brute power requires a CPU which can keep pace with it. The 450MHz Pentium II is the fastest on the market and is an excellent companion to the Diamond card. Gamers who want even more processing power might consider overclocking the CPU, although this is a risky operation. The Carrera system also has the most powerful sound card on the market. Equipped with a RISC processor as powerful as a Pentium 133, the SoundBlaster Live! is a gamer's dream. The Power Pro comes with four surround speakers and a subwoofer, and Carrera has included a driving wheel with force feedback.

The 17in LG77T monitor is able to support a refresh rate of 75Hz at 1280x1024. Built using shadow mask technology, the LG monitor has a 0.28mm dot pitch. Although the screen was consistently bright and the images sharp at all resolutions, some of the colours in the blue region of the visible spectrum were washed out. The pushbutton controls are easy to access and manipulate.

HIGHLY COMMENDED PERSONAL COMPUTER WORLD

PCW DETAILS

Price *£1,550 (£1,319 ex VAT)*
Contact *Carrera 0171 830 0486*
www.carrera.co.uk
Good Points *Excellent graphics and sound.*
Bad Points *None.*
Conclusion *A true gaming system.*

Build Quality	★★★★
Performance	★★★★★
Value for Money	★★★
Overall Rating	★★★★

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"Overall, the TII came close to the award-winning machine in our PII round-up published in issue 143, Compaq's Armada 7800, while costing a thousand pounds less. It also out-performed our two value award winners in that round-up, both of which are comparable to the TII in terms of cost. (PC Plus December 1998)

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PC Direct January 1998

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What PC? Review March 98

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Gateway G6-350

Games system

The first gaming system Gateway sent us had a faulty motherboard. The replacement came with an Intel Tolstoy BX motherboard with a 350MHz PII processor. To provide 3D acceleration for games, an STB Blackmagic Voodoo2 card was included. Although it's a good 3D accelerator with support for single-pass multitexturing, it's not quite as powerful as the Viper V550.

Also, the Voodoo2 chipset does not support advanced features like specular lighting and bump mapping. A SoundBlaster 64 provides audio via a pair of Altec Lansing speakers. Although it's a PCI sound card, the SB 64 is not as impressive as the SB Live!. Its positional 3D sound output from the two speakers is a feeble attempt at true surround sound.

The Gateway system has a DVD-ROM but no MPEG-2 decoder card. Even with the power of the 350MHz CPU, software DVD playback results in dropped frames. One reason for this is that the main STB Velocity display card does not support motion compensation. The PC has a large 10.2Gb hard drive, big enough to keep the most avid application-hoarder happy for a while, and an Iomega Zip drive. The G6-350 was the only system that came in a desktop case. Smaller than the tower models, the interior was slightly cramped. With two free PCI slots and a single ISA slot, the Gateway system is not as easily upgradeable as others in the group.

The 17in Gateway monitor is not as good as the LG77T nor the ADI 5GT. Its refresh rate of 1024x768 is an acceptable 85Hz but this falls to a poor 60Hz at 1280x1024. Its colour fidelity and image sharpness are on a par with others, though.

PCW DETAILS

Price *£1,397 (£1,189 ex VAT)*
Contact *Gateway 0800 552000*
www.gateway.com/uk
Good Points *Powerful. Dedicated 3D graphics card. DVD-ROM.*
Bad Points *Average sound card. No hardware MPEG-2 decoder.*
Conclusion *Some good components, but not the most powerful gaming PC.*

Build Quality	★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

Mesh Elite Terminator 350

Games system

Unlike Armari, Carrera and Gateway, Mesh supplied a PC with an AMD processor. Running at 350MHz, the K6-2 is an excellent choice for a gaming system. This is because its 27 3D Now! instructions speed up floating-point calculations, giving it an edge over a Pentium II of the same speed. The Hercules Terminator Beast graphics card, although fearsome in name, is not as powerful as the Diamond Viper V550, but in games which do not use multitexturing it is still faster than a dedicated 3D accelerator like the Voodoo2. The Savage 3D chipset on which it is built is also the only one that supports texture compression, part of Microsoft's new DirectX 6 API.

The Teac PowerMax multimedia system is another impressive part of the Mesh PC. Consisting of five speakers and a dedicated subwoofer, the PowerMax is capable of reproducing true Dolby Pro Logic surround sound. Unfortunately, it lacks support for superior Dolby AC-3, so users will not be able to hear DVD movie soundtracks in their full glory. The AWE 64 Gold, although one of the best ISA sound cards ever produced, is not as powerful as its successor, the SoundBlaster Live!. It also lacks support for surround sound.

The Mesh system is well built. All the wires and IDE cables are kept well out of the way and the components are easily accessible. It has three PCI slots and one free ISA slot.

The 17in ADI 5GT monitor is built using Sony's Trinitron technology. With a 0.26mm dot pitch, this monitor supported the highest refresh rates in this group test. Its picture quality and colour fidelity are among the best.

PCW DETAILS

Price *£1,500 (£1,275 ex VAT)*
Contact *Mesh 0181 208 4700*
www.meshplc.co.uk
Good Points *Powerful graphics card. DVD-ROM with MPEG-2 decoder. Excellent speakers.*
Bad Points *Average sound card.*
Conclusion *A powerful gaming system that deserves consideration.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

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YEAR 2000 HARDWARE COMPLIANT

32MB SDRAM 2.1GB HDD Windows 98	Pentium MMX 233 MHz		Intel Mobile Pentium 200 MHz		Intel Mobile Pentium 233 MHz		Intel Mobile Pentium 266 MHz		Intel Mobile Pentium II 233 MHz		Intel Mobile Pentium II 266 MHz		Intel Mobile Pentium II 300 MHz	
	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT
12.1" TFT Active	£849.00	£997.58	£875.00	£1028.13	£925.00	£1086.88	£975.00	£1145.63	£1025.00	£1204.38	£1125.00	£1321.88	£1299.00	£1526.33
13.3" TFT Active	£925.00	£1086.88	£949.00	£1115.08	£999.00	£1173.83	£1049.00	£1232.58	£1099.00	£1291.33	£1199.00	£1408.83	£1375.00	£1615.63
14.1" TFT Active	£999.00	£1173.83	£1025.00	£1204.38	£1075.00	£1263.13	£1125.00	£1321.88	£1175.00	£1380.63	£1275.00	£1498.13	£1449.00	£1702.58

AJP 979

Totally Functional

AJP 979 Specification

- 14.1", 13.3" TFT Active LCD XGA 1024x768 resolution or 12.1" TFT Active LCD SVGA 800x600 resolution
- Intel Mobile Module Pentium processor 200/233/266MHz upgradeable to Intel Mobile Pentium II processor 233/266/300MHz
- Intel 430TX/440BX Chipset on motherboard
- 64MB SDRAM upgradeable to 192MB
- 3.2GB HDD upgradeable to 6.4GB. Supports Ultra DMA, ATA-33
- 4MB Video RAM, 64 bit video adapter, 2D/3D graphics accelerator
- 512KB secondary cache pipeline burst synchronous RAM
- 24 Speed CD ROM Drive interchangeable with optional DVD Drive
- User removable 3.5" 1.44MB FDD supplied as standard, interchangeable with optional: Iomega Zip Drive, LS-120 Drive, 2nd Battery, 2nd Hard Disk Drive
- 1 x Type III and 1 x Type II PCMCIA slots. Supports ZV card
- 3-D sound, 16 bit stereo, full duplex sound card, stereo speakers, microphone
- Ports: 2 Universal Serial Bus (USB), Video-In (Video Capture), Video-Out (TV Output), Serial, Parallel, Monitor, Port Replicator, PS/2 Mouse and Keyboard, Game Port, IrDA
- Li-Ion battery delivers approximately 2hrs continuous use
- Windows 98 supplied as standard preloaded with CD's and manual. (or Windows 95)
- Software MPEG supplied as standard
- Dimensions: 316mm (W) x 259mm (D) x 55mm (H) Weight: 3.5Kg

Upgrade to 128MB RAM, 4GB HDD £149 +VAT

12.1" TFT, 3.2GB HDD, 64MB RAM, 200MHz MMO, WINDOWS 98 **999 +VAT** MODULAR FOR THE POWERUSER

YEAR 2000 HARDWARE COMPLIANT

64MB SDRAM 3.2GB HDD Windows 98	Intel Mobile Pentium 200 MHz		Intel Mobile Pentium 233 MHz		Intel Mobile Pentium 266 MHz		Intel Mobile Pentium II 233 MHz		Intel Mobile Pentium II 266 MHz		Intel Mobile Pentium II 300 MHz	
	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT	Exc. VAT	Inc. VAT
12.1" TFT Active SVGA	£999.00	£1173.83	£1049.00	£1232.58	£1099.00	£1291.33	£1149.00	£1350.08	£1249.00	£1467.58	£1425.00	£1674.38
13.3" TFT Active XGA	£1075.00	£1263.13	£1125.00	£1321.88	£1175.00	£1380.63	£1225.00	£1439.38	£1325.00	£1556.88	£1499.00	£1761.33
14.1" TFT Active XGA	£1149.00	£1350.08	£1199.00	£1408.83	£1249.00	£1467.58	£1299.00	£1526.33	£1399.00	£1643.83	£1575.00	£1850.63

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Account is interest free if repaid in full with the ninth montly payment. A 5% deposit is required. At the offset a 48 month finance agreement is issued at 29.8% APR. Typical example: £1000.00 less 5% deposit; financed sum £950.00.

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B) For a 9 month INTEREST FREE finance agreement, 8 monthly payments of £32.25 and the balance of £692.00 on tth 9th month (total payable £950.00 APR 0%).

All loans are subject to status. Written quotations available on request. AJP is a licensed Credit Broker.

3 YEAR WARRANTY AVAILABLE

Options and upgrades

	Exc. Vat £	Inc. Vat £
Upgrade RAM per MB	3.00	3.53
Upgrade from 3.2GB to 4GB HDD	35.00	41.13
Upgrade from 3.2GB to 5GB HDD	49.00	57.58
Upgrade from 4 GB to 6.4GB HDD	115.00	135.13
Additional 3.2GB HDD	149.00	175.08
Additional 4GB HDD	185.00	217.38
Additional 5GB HDD	199.00	233.83
Additional 6.4GB HDD	299.00	351.33
HDD Housing Kit	39.00	45.83
Upgrade from NiMH to Li-Ion Battery	49.00	57.58
Additional NiMHBattery	49.00	57.58
1100 Additional Li-Ion Battery	99.00	116.33

	Exc. Vat £	Inc. Vat £
PCMCIA Ethernet Card 10 Mbps (BNC & 10BT)	69.00	81.08
PCMCIA Ethernet Card 10 /100 Mbps (BNC & 10BT)	99.00	116.33
PCMCIA Fax/Modem (56K)	99.00	116.33
PCMCIA Fax/Modem (GSM/PSTN)	239.00	280.83
PCMCIA MPEG II Card	149.00	175.08
MPEG II Hardware	99.00	116.33
Battery Charger	125.00	146.88
Port Replicator	99.00	116.33
Car Adapter	45.00	52.88
Iomega Zip Drive (100MB)	175.00	205.63
LS-120 Drive (120MB)	125.00	146.88
DVD Drive	199.00	233.83

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AJP 8500 & AJP 8500M Specification

PC Advisor AUG 98 · SEPT 98 · OCT 98 · NOV 98 · DEC 98

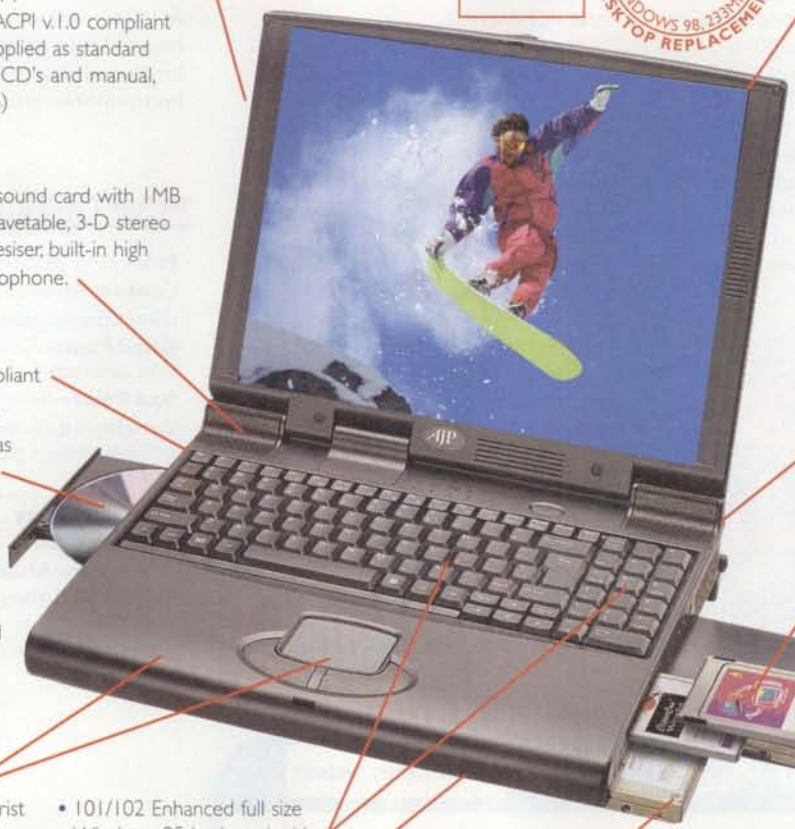
- 8500M: Intel Mobile Pentium processor 200/233/266MHz upgradeable to Intel Mobile Pentium II processor 233/266/300MHz
- 8500: Intel Pentium MMX processor 233MHz
- Intel 430 TX/440BX Motherboard Chipset
- 64MB SDRAM upgradeable to 128MB
- 512KB secondary cache pipeline burst synchronous RAM
- Full PC 97 and ACPI v.1.0 compliant
- Windows 98 supplied as standard preloaded with CD's and manual, (or Windows 95)

Upgrade to 128MB RAM, 4GB HDD £149 +VAT

15.1" TFT, 3.2GB HDD, 64MB RAM, WINDOWS 98, 233MHz 1375 +VAT DESKTOP REPLACEMENT

- 15.1" TFT Active Colour XGA LCD
- 1024 x 768 resolution, 16 million True Colo
- 4MB Video RAM, 64 bit, 2D/3D graphics accelerator

15.1" XGA DISPLAY



- The 15.1" LCD display is equivalent to the viewable screen size of a 17" monitor. Also the full size keyboard and separate numeric keypad makes this notebook the ideal desktop replacement.
- 16-bit stereo, full duplex sound card with 1MB MASK ROM hardware wavetable, 3-D stereo sound, ESFM music synthesiser, built-in high power speakers and microphone.
- Infra red wireless communication port. IrDA 1.1, FIR, ASKIR compliant
- User removable 24 speed CD ROM drive supplied as standard, interchangeable with optional:
- DVD Drive
- Software MPEG supplied as standard. Supports optional MPEG II hardware accelerator card
- Ports: 2 x Universal Serial Bus (USB), Video In (video capture), Video Out (high definition TV output), Serial, Parallel, Monitor, 2 x PS/2 Keyboard & Mouse, Port Replicator

- PCMCIA Type III slot allows use of up to two Type II PCMCIA Cards or one Type III. Supports Zoomed Video port
- User removable floppy disk drive, supplied as standard, provides additional flexibility to interchange with optional:

- Ergonomically designed wrist rest with two button track pad
- 101/102 Enhanced full size Windows 95 keyboard with numeric keypad
- Li-Ion battery delivers approx. 2.5 hours continuous use
- User removable/ interchangeable 'pocket size' 2.5" 3.2GB hard disk drive upgradeable to 6.4GB
- Supports Master Mode EIDE, ATA-33, Ultra DMA/33

- 2nd Hard Disk Drive
- Iomega Zip 100MB Drive
- LS-120 120MB Drive

YEAR 2000 HARDWARE COMPLIANT

Size: 357mm (W) x 275mm (D) x 50 (H). Weight: 4.6Kg

64MB SDRAM 3.2GB HDD Windows 98	Pentium MMX 233 MHz		Intel Mobile Pentium 200 MHz		Intel Mobile Pentium 233 MHz		Intel Mobile Pentium 266 MHz		Intel Mobile Pentium II 233 MHz		Intel Mobile Pentium II 266 MHz		Intel Mobile Pentium II 300 MHz	
	Exc VAT	Inc VAT	Exc VAT	Inc VAT	Exc VAT	Inc VAT	Exc VAT	Inc VAT	Exc VAT	Inc VAT	Exc VAT	Inc VAT	Exc VAT	Inc VAT
15.1" TFT Active	£1375.00	£1615.63	£1399.00	£1643.83	£1449.00	£1702.58	£1499.00	£1761.33	£1549.00	£1820.08	£1649.00	£1937.58	£1825.00	£2144.38

AJP 8500

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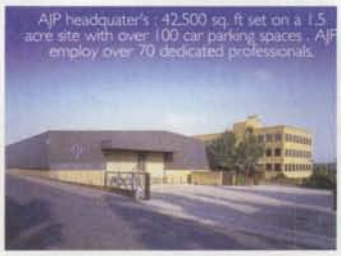

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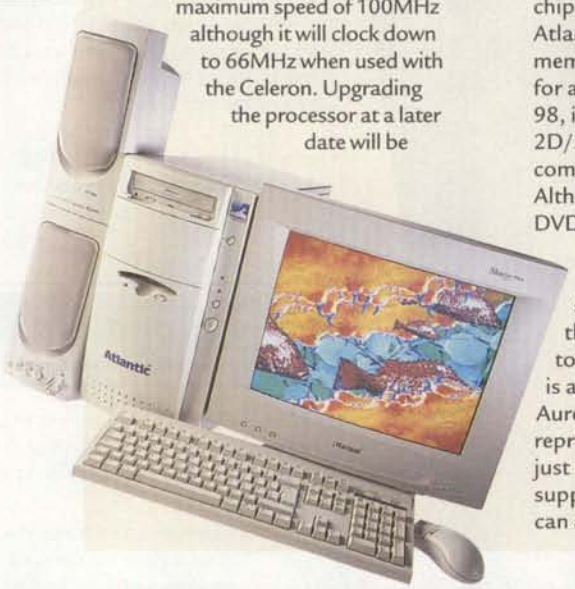
Atlantic **Pro 98**

Mid-range system

The Atlantic Pro 98, like the Tiny Family Bonus system [*p148*], houses the 333MHz Celeron processor with 128Kb of L2 cache and comes with a BX motherboard. With its capacity to handle bus speeds of up to 100MHz, this motherboard can hold processors faster than 500MHz. Atlantic has included 64Mb of PC 100 SDRAM. This memory runs at a maximum speed of 100MHz although it will clock down to 66MHz when used with the Celeron. Upgrading the processor at a later date will be easy, as the motherboard and RAM are ready to run faster and so give a big performance boost. The 6.4Gb hard drive in the Pro 98 is larger than the one in Tiny's system and is adequate for a family PC. There are three PCI slots free.



The ATi Xpert 98 graphics card is based on the 64-bit Rage Pro Turbo chipset. Even though the card in the Atlantic system has only 4Mb of memory, it is upgradeable to 8Mb for a little more money. The Xpert 98, in addition to being a good 2D/3D card, also supports motion compensation for DVD playback. Although Pro 98 does not have a DVD-ROM, users who intend to upgrade can mobilise the help of the graphics card for software playback, provided the processor is powerful enough to support it. The Terratec Xlerate is a PCI sound card which supports Aureal's A3D API. This enables it to reproduce surround sound through just two speakers. Due to its support for 64 voices, the Xlerate can also function as a MIDI card.

The 17in Hansol 700 monitor supports resolutions up to 1280x1024 but its refresh rate at that resolution is a flickery 60Hz. At lower resolutions the refresh rate rises to 85Hz. Its screen is not as bright and clear as the ADI and Iiyama monitors in this group test.

PCW DETAILS

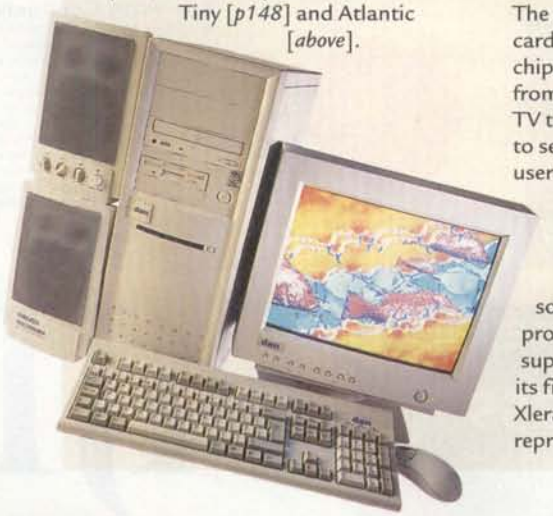
Price *£997 (£899 ex VAT)*
Contact *Atlantic 0990 134725*
www.atlanticsystems.com
Good Points *Easily upgradeable. Well constructed.*
Bad Points *Average monitor.*
Conclusion *An easily upgradeable system with some good components.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

Dan **Xplora II Plus**

Mid-range system

When Intel released the original Celeron processor, it was heavily criticised for its lack of L2 cache and consequent poor performance in office applications. However, its successor, the 333MHz processor with 128Kb L2 cache, is proving popular with system vendors. The Dan Xplora, like four other systems in this group test, comes with this CPU. It has a motherboard based on the BX chipset, as do the systems from Tiny [*p148*] and Atlantic [*above*]. Currently running at 66MHz, the speed of the frontside bus can be increased to 100MHz if a faster processor, such as a Pentium II 350, is inserted. Its ability to accommodate CPUs beyond 500MHz makes it the ideal platform for upgrading.



This Dan system is well built, with ample ventilation. Its two free DIMM slots, four PCI slots and two 5.25in bays make it easy to upgrade. The ATI All-in-Wonder Pro graphics card is built on the Rage Pro Turbo chipset. What differentiates this from the Xpert 98 is a high-quality TV tuner: in addition to being able to see a TV display on the monitor, users can capture the images as AVI or BMP files. However, the TV tuner does need a boosted signal to work properly.

The AWE 64 Value is an ISA sound card using the EMU1000 processor. Although it is able to support 64 voices simultaneously, its fidelity is not as high as the PCI Xlerate sound card. Also, it cannot reproduce surround sound through two speakers. The Dan Hi-Fi speakers are very good quality.

The 15in CTX monitor handles refresh rates up to 85Hz at 1024x768 but this falls to a flickery 60Hz at its highest resolution of 1280x1024. Overall, this CTX monitor is not quite as good as the ADI Microscan 4P.

PCW DETAILS

Price *£1,018 (£866 ex VAT)*
Contact *Dan 0181 830 1100*
www.dan.co.uk
Good Points *Well constructed. Good graphics card.*
Bad Points *Average sound card.*
Conclusion *An easily upgradeable system, slightly let down by an average monitor.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★
Overall Rating	★★★

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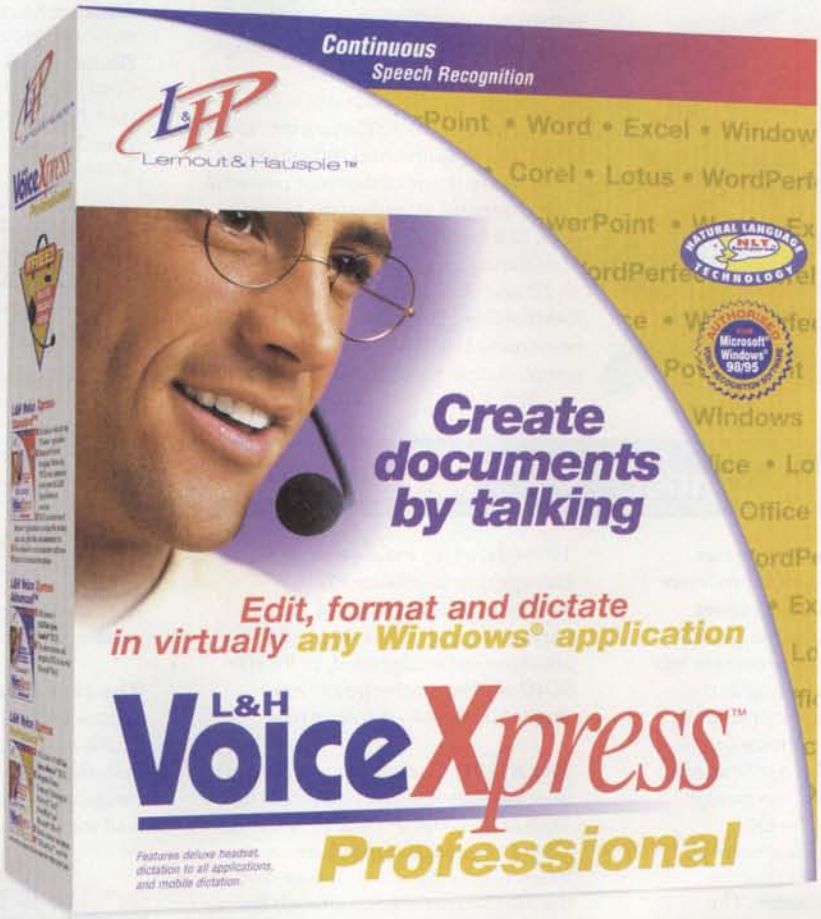

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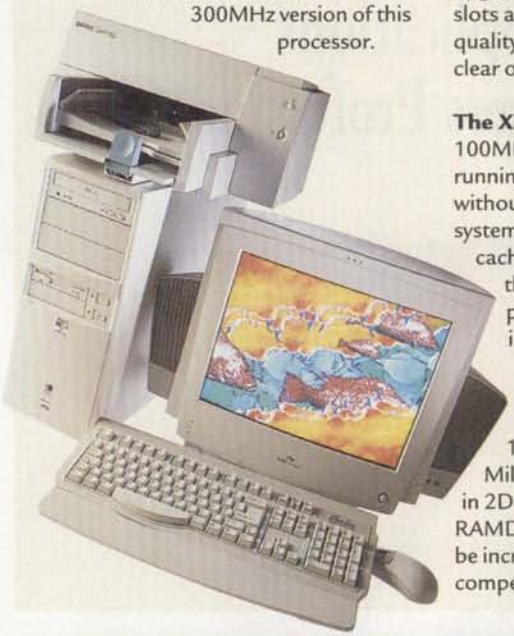
Mertec XM300-K2

Mid-range system

Although Intel has an overall market share of 85 percent, the budget PC market rests firmly in the hands of AMD. Its new K6-2 processor, with 27 hard-coded MMX-style instructions that speed up floating-point calculations, has been well received by system vendors. Mertec's XM300 uses the 300MHz version of this processor.



The AMD processor comes on a Super Socket 7 motherboard. Like the BX motherboard used for Intel's processors, the Super 7 is capable of running at 100MHz and can support K6-2 processors faster than 500MHz. The Mertec system can be easily upgraded by virtue of its two free DIMM slots and three PCI slots. The build quality is excellent, with cables kept clear of any critical components.

The XM300 has 64Mb of RAM, of the 100MHz variety, which is enough for running Windows 98 applications without any major hiccups. The Mertec system additionally comes with 1Mb of cache on the motherboard. Although this is supposed to boost performance, it was not reflected in the system's SYSmark test score. The Millennium G200 graphics card is one of the most powerful around. Based on the Matrox 128-bit G200 chipset, the 8Mb Millennium is an excellent performer in 2D and 3D applications. It has a high RAMDAC of 250Hz and its memory can be increased to 16Mb. It also has motion compensation for DVD playback.

The 17in ADI 5P monitor is not as good as the costlier ADI 5GT. With a 0.28mm dot pitch, this shadow mask monitor supports a resolution of 1280x1024 at a flickery 60Hz. Its refresh rate increases to 85Hz at lower resolutions.

PCW DETAILS

Price *£999 (£850 ex VAT)*
Contact *Mertec 01792 473700, www.mertec.co.uk*
Good Points *Well constructed. Good graphics and sound.*
Bad Points *Average performance.*
Conclusion *An easily upgradeable system.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★★
Overall Rating	★★★

Tiny Family Bonus

Mid-range system

The Family Bonus system has Intel's latest 333MHz processor from the low-cost Celeron series. Unlike the original Celeron, which had no cache, the new processor has 128Kb of L2 cache running at the same clock speed as the processor. This makes it a good choice for running routine office applications like Word and Excel. Even though the Celeron has its own EX motherboard, Tiny has chosen a superior BX model, making the system easily upgradeable. The Microstar motherboard can handle frontside bus speeds of 66MHz and 100MHz, which means the buyer can upgrade to a faster PII processor. But to get a real performance kick, the RAM will also have to be upgraded, to PC100 SDRAM. The motherboard has three PCI and two ISA slots free.

The ATI 3D Charger graphics card uses an older Rage II chipset and has 4Mb of SDRAM. It's not as powerful as ATI's own next-generation cards, based on the Rage Pro chipset, but the 3D Charger is good enough for regular work. The 4Mb of memory is not upgradeable, though. Users who want high resolutions at better colour depths will have to replace the graphics card. The Yamaha sound card pushes sound out of two very stylish speakers and its fidelity is above average.

Living up to its name, the Family Bonus comes with three PC peripherals: the Umax Astra 610P scanner (*Editor's Choice in our September '98 group test*), the Epson Stylus Color 300 printer and the Fuji DX-5 digital camera with 4Mb of Flash memory. The Tiny system is certainly value for money.

EDITOR'S CHOICE PERSONAL COMPUTER WORLD

The 15in Tiny monitor does not support resolutions beyond 1024x768, and at that resolution its refresh rate falls to 65Hz. The images have good clarity, though, and the controls are easy to access.

PCW DETAILS

Price *£1,056 (£899 ex VAT)*
Contact *Tiny 0800 821333 www.tiny.com*
Good Points *Easily upgradeable. Free scanner, printer and digital camera.*
Bad Points *Average monitor.*
Conclusion *A well built system that is excellent value for money.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★★★
Overall Rating	★★★★

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OVERALL WINNER: Desktop systems

	Score (better ➤)
Dan	82.40
Dell	81.78
HP	78.94
Fujitsu	75.30
IBM	75.23
Gateway	74.93
Viglen	74.62
Compaq	74.47
AST	74.44
Simply	73.97
Evesham	73.55
Elonex	72.29
Packard Bell	68.58
Tiny	67.18
Colossus	64.47

WINNER: Overall satisfaction with service and reliability

	Score (better ➤)
Dan	4.34
Evesham	3.98
Simply	3.96
Dell	3.96
Gateway	3.95
Viglen	3.80
Fujitsu	3.76
HP	3.73
Elonex	3.73
IBM	3.68
Compaq	3.60
AST	3.59
Packard Bell	3.50
Colossus	3.43
Tiny	3.32

WINNER: Satisfaction with technical support

	Score (better ➤)
Dan	4.31
Evesham	3.79
Gateway	3.75
Fujitsu	3.72
Elonex	3.72
Simply	3.68
Viglen	3.57
Dell	3.56
IBM	3.50
HP	3.42
Compaq	3.27
Packard Bell	3.27
Colossus	3.23
AST	3.18
Tiny	2.95

WINNER: Satisfaction with reliability

	Score (better ➤)
Dan	4.53
Dell	4.43
AST	4.31
Simply	4.30
Gateway	4.28
Evesham	4.28
HP	4.27
IBM	4.21
Viglen	4.18
Fujitsu	4.17
Compaq	4.16
Elonex	4.00
Tiny	3.94
Packard Bell	3.93
Colossus	3.86

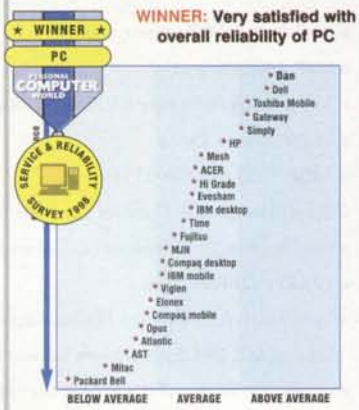
WINNER: Satisfaction with repairs

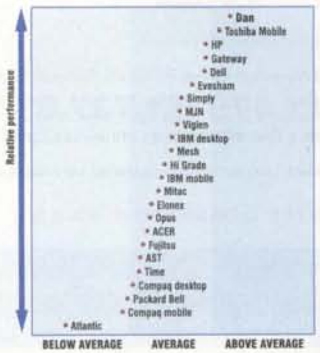
	Score (better ➤)
Dan	4.18
Simply	4.02
Evesham	3.96
Viglen	3.82
Gateway	3.79
Dell	3.78
Elonex	3.78
Fujitsu	3.68
AST	3.62
IBM	3.57
Packard Bell	3.54
HP	3.51
Compaq	3.49
Colossus	3.38
Tiny	2.97

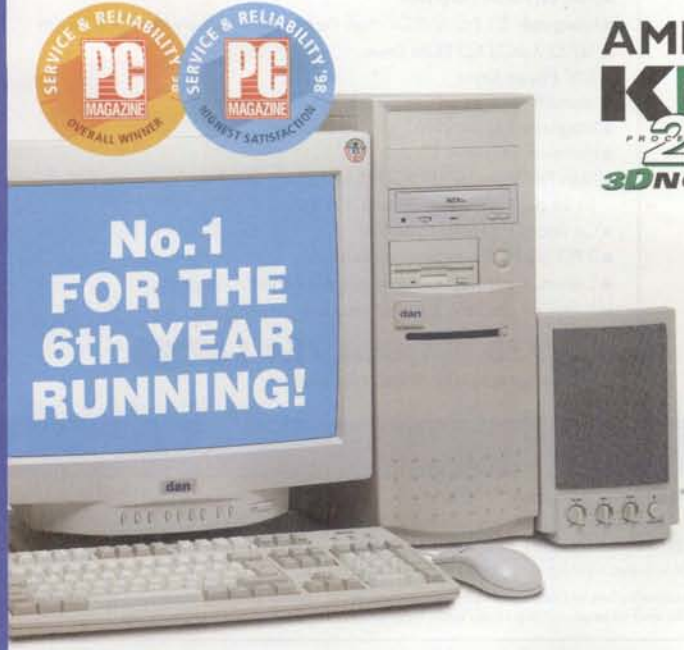
WINNER: Likelihood of repurchasing from the same vendor

	Score (better ➤)
Dan	4.33
Dell	4.06
Gateway	3.99
Evesham	3.91
Simply	3.84
HP	3.74
Viglen	3.64
Fujitsu	3.47
Compaq	3.46
IBM	3.43
Elonex	3.42
Tiny	3.40
Colossus	3.25
Packard Bell	3.25
AST	3.22

... and Personal Computer World readers agreed.







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Dabs Direct **Atlantis Home Value** • Budget system

As the Dabs Direct system emerged from its box, we heard a metallic clang inside the ATX case. Opening up the system, there were unidentifiable bits of metal at the bottom of the case which could have damaged the components.

The Atlantis Home Value is not such good value for money as the others in this group, the main reason being the 266MHz Celeron processor (the original model Intel launched in early 1998).

With no L2 cache and a slower clock speed than the 300MHz version, this CPU performs poorly in business applications (see its low SYSmark score, *p162*). Dabs has chosen an Abit 440LX motherboard for the Celeron. These motherboards have a reputation for being stable platforms for over-clocking, and due to the absence of L2 cache, the original Celeron is quite tolerant to this. The Atlantis system has only a tiny 2.1Gb hard drive and this limited storage could easily become filled.

The construction of the Dabs system is not as tidy as the Elonex PC [*below*]. The wires and IDE cables are a tangled web, preventing easy access to the components, but at least it is well ventilated. And, in addition to the free DIMM slot, there are three 5.25in bays free.

The graphics card is based on the S3 Virge chipset. Although a good performer in 2D applications, it is far less powerful than the ATI Rage Pro and Riva 128 processors. This chipset also has some well-known compatibility problems with a few popular PC components.

The 14in Belinea monitor has a poor refresh rate of 60Hz at 1024x768. Even at lower resolutions, the refresh rate does not rise beyond 75Hz. Image sharpness also suffers at its highest resolution.

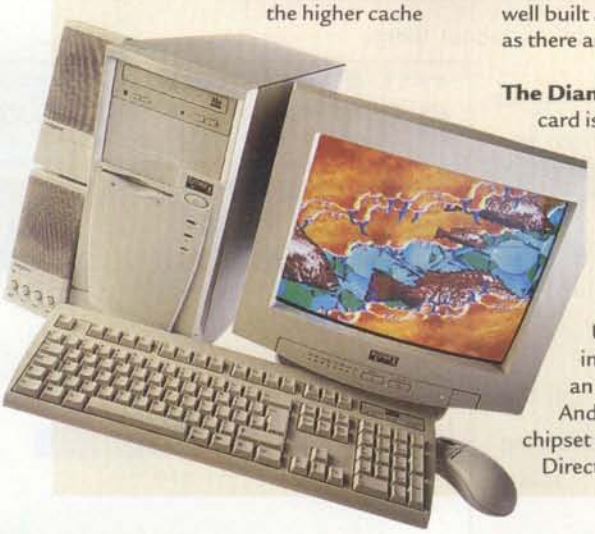
PCW DETAILS

Price *£699 (£595 ex VAT)*
Contact *Dabs Direct 0800 558866* www.dabs.com
Good Points *Free bays for expansion. Easy to over-clock.*
Bad Points *Poor construction. Mediocre performance. Old components.*
Conclusion *A budget system worth consideration if no other can be found.*

Build Quality	★★★
Performance	★★
Value for Money	★★
Overall Rating	★★

Elonex **MLX-6333/1** • Budget system

The original Celeron processor failed to make an impression but its successor, with 128Kb cache, has fared better. The Elonex system comes with the 300MHz version of this processor. With its L2 cache running at the same core speed as the processor, the new Celeron is only slightly slower in office applications than a PII of the same speed. Its floating-point engine is identical to that of a PII and, with the higher cache speed, it is a slightly better choice than PIIs clocked at the same speed for running games and multimedia applications. The Celeron comes on an EX motherboard. The EX chipset was specially designed as a low-cost solution to hold the Celeron and has a frontside bus speed of 66MHz. Although adequate for running the Celeron, the PC is not as easily upgradeable as those with BX motherboards. The system is very well built and is easily upgradeable as there are three free slots.



The Diamond Viper V330 graphics card is based on the 128-bit Riva 128ZX chipset. It has 8Mb of SDRAM and is a good performer in 2D and 3D applications. The V330 supports DirectX and OpenGL APIs.

Unlike the other systems in this group, the MLX has an on-board sound card. And, the Yamaha YMF 715 chipset fully supports the DirectSound API, so with high-quality audio output it's a good component to be included with this budget PC.

HIGHLY COMMENDED PERSONAL COMPUTER WORLD

The 14in Elonex monitor is the best small monitor in this group test. It has excellent colour fidelity and image sharpness, and sustains a high refresh rate of 120Hz at 1024x768.

PCW DETAILS

Price *£699 (£595 ex VAT)*
Contact *Elonex 0181 452 4444* www.elonex.co.uk
Good Points *High-quality construction. Excellent monitor.*
Bad Points *Motherboard cannot take Pentium II processors.*
Conclusion *A well-built budget PC with all important components.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★★
Overall Rating	★★★★

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Linear **Vantage XL**

Budget system

Proving the value of Intel's low-cost processor yet again, Linear's Vantage XL system comes with the 300MHz version of the new Celeron. With 128Kb cache on the processor itself, it is an excellent choice for a budget PC. With performance on office applications only slightly less than a Pentium II of the same speed, the new CPU is good value for money. The Vantage system's 64Mb RAM comes in two modules, which is unfortunate as there are no DIMM slots free for upgrading. The ATX tower case is rather small, making the interior feel crowded. The XL has a 32X CD ROM drive and a 4.3Gb hard drive. The latter is good enough for a low-priced system and is capable of coping with most routine storage needs.

The PCI version of the ATI All-in-Wonder Pro is included in Linear's system. Although the card has 8Mb of RAM, performance trails behind its AGP counterpart. This is partly reflected in the Linear system's low SYSmark and Final Reality scores. The All-in-Wonder Pro uses the 64-bit Rage Pro chipset. With the help of the powerful floating-point unit in the Celeron, the card provides good 3D acceleration. It has a built-in TV tuner and the ability to capture video in AVI format.

The Creative Labs Vibra 16S sound card is not the most vibrant on the market. Being an ISA model, it is capable of handling only 16 voices simultaneously and is therefore not as good as the next-generation AWE 32 and AWE 64 models.

The 15in Relisys monitor has a 0.28mm dot pitch and supports resolutions as high as 1024x768 at a respectable 75Hz. Its controls are easy to access and image quality is excellent.

PCW DETAILS

Price *£699 (£595 ex VAT)*
Contact *Linear Direct 0181 408 9888 (no URL)*
Good Points *Excellent monitor.*
Bad Points *Crowded interior. Mediocre performance. No free DIMM slots.*
Conclusion *A budget system with no special components.*

Build Quality	★★★
Performance	★★
Value for Money	★★★
Overall Rating	★★★

Roldec **Puma**

Budget system

Advanced Micro Devices (AMD) processors appear in over 50 percent of budget PCs, so it is not surprising to a find a powerful AMD processor at the heart of such a system as this. The Roldec Puma sports the 333MHz version of AMD's new K6-2 processor. The K6-2 has 27 3D Now! instructions on it which help to speed up floating-point calculations. If properly supported by the application, the K6-2 can be more powerful than a Pentium II of the same speed, which makes the Puma a good system for running office applications as well as multimedia programs.

The Diamond Viper V330 graphics card, with 4Mb of memory, uses the Riva 128 chipset. It is one of the few cards with optimised drivers to take advantage of the new 3D Now! instructions. Hence, it is a good companion to the AMD processor. New AMD and Cyrix CPUs run on Super Socket 7 motherboards. The Microstar motherboard in the Puma system has a frontside bus speed of 100MHz so Roldec had fitted 100MHz SDRAM, and it is able to handle processors faster than 500MHz. The Roldec Puma has a 4.5Gb hard drive and a claimed 40X CD-ROM. However, our tests show that the actual average speed of the Asus CD-ROM is only around 24X. The Sonic Impact S90 sound card is the latest from Diamond Multimedia. Using Aureal's Vortex chipset, the S90 is able to reproduce surround sound from two speakers.

The 15in ADI monitor, although smaller than the 5P and 5GT, has the same 0.28mm dot pitch and high image quality. It has a maximum resolution of 1024x768 at a respectable refresh rate of 75Hz.

PCW DETAILS

Price *£699 (£595 ex VAT)*
Contact *Roldec Systems 01902 456464 www.roldec.com*
Good Points *Powerful processor. Good graphics card and sound card.*
Bad Points *None.*
Conclusion *A budget system that is good value for money.*

Build Quality	★★★★
Performance	★★★
Value for Money	★★★★
Overall Rating	★★★★

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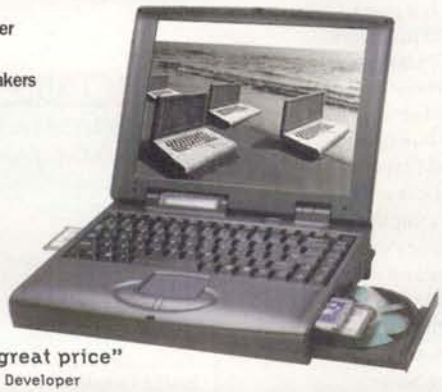

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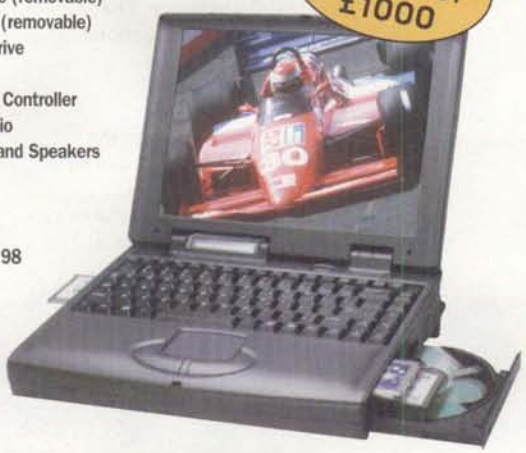

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Predator 333MHz System, PC Magazine August 1998 Volume 7 Issue 8

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Table of features

Manufacturer	Armari	Carrera	Gateway	Mesh Computers	Atlantic	Dan Technology
Model Name	NBX-350 9S	Power Pro 2-450	G6-350	Elite Terminator 350	Pro 98	Dan Xplora II Plus
Price (ex VAT)	£1,275	£1,319	£1,189	£1,275	£899	£866
Price (inc VAT)	£1,498	£1,550	£1,397	£1,500	£997	£1,018
Telephone	0181 810 7441	0171 830 0486	0800 552000	0181 208 4700	0990 134725	0181 830 1100
Web address	www.armari.com	www.carrera.co.uk	www.gateway.com/uk	www.meshplc.co.uk	www.atlanticsystems.com	www.dan.co.uk
Processor	Intel Pentium II 350	Intel Pentium II 450	Intel Pentium II 350	AMD K6-2 350	Intel Celeron A 333	Intel Celeron A 333
RAM supplied	128Mb	64Mb	64Mb	128Mb	64Mb	64Mb
RAM type	PC 100 SDRAM	PC 100 SDRAM	PC 100 SDRAM	PC 100 SDRAM	PC100 SDRAM	66MHz SDRAM
DIMMs occ/free	1/2	1/2	1/2	2/1	1/2	1/2
HD size	9.1Gb	10.1Gb	10.2Gb	10Gb	6.4Gb	4.3Gb
HD access time	9.5ms	9ms	10ms	9ms	9ms	12ms
HD interface	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA
Motherboard	Asus P2B	Super Micro P6 SBA	Intel Tolstoy	EPOX Socket 7	Intel SE440BX NA	Asustek P2B
Chipset	Intel 440BX	Intel 440BX	Intel 440BX	ETEQ 82c 66 38	Intel 440BX	Intel 440BX
L2 cache/max	512Kb/512Kb	512Kb/1Mb	512Kb/512Kb	1Mb/1Mb	512Kb/512kb	128Kb/128Kb
Free 3.5/5.25in bays	2/2	1/2	2/1	2/1	1/2	1/2
PCI/ISA/shared slots	4/2/1	4/3/1	3/1/1	4/2/1	3/1/2	4/3/1
USB/ser/par/PS/2	2/2/1/2	2/1/1/2	2/1/1/2	2/2/1/2	2/2/1/2	2/2/1/2
CD-ROM manuf.	Creative Labs	LG Electronics	Toshiba	Creative Labs	Samsung	Teac
CD-ROM model	PC-DVD-ROM 2240E	DRD-820B DVD-ROM	DVD-ROM	PC-DVD	CD ROM	CD532E
CD-ROM speed	2X DVD/20X CD	2X DVD/20X CD	2X DVD/24X CD	2X DVD/20X CD	32X	32X
CD-ROM interface	EIDE	EIDE	EIDE	EIDE	Ultra DMA	EIDE
Sound card manuf.	Diamond	Creative Labs	Creative Labs	Creative Labs	Terratec	Creative
Sound card model	Sonic Impact S90	SoundBlaster Live!	SoundBlaster 64	AWE64 Gold	Xlerate PCI A3D	AWE 64 Value
Speakers	Yamaha YST-MS25	Cambridge PC Works	Altec Lansing GCS100	Teac Powermax 1000	Atlantic 160W (PMPO)	Dan Hi-Fi Speakers
Graphics card manuf.	Diamond	Diamond	STB	Hercules	ATI	ATI
Graphics card model	Viper V550	Viper V550	Velocity	Terminator	Xpert98	All-in-Wonder Pro
Graphics interface	AGP	AGP	AGP	AGP	AGP	AGP
Graphics RAM/Max	16Mb/16Mb	16Mb/16Mb	8Mb/8Mb	8Mb/8Mb	4Mb/8Mb	4Mb/8Mb
Monitor	Iiyama S7029T	LG 77T	Gateway rebadge	ADI 5GT	Hansol 700	CTX FST
Monitor size (ins)	17in	17in	17in	17in	17in	15in
Refresh - 800 x 600	120Hz	120Hz	85Hz	120Hz	85Hz	85Hz
Refresh - 1024x768	90Hz	85Hz	85Hz	120Hz	85Hz	85Hz
Refresh - 1280x1024	80Hz	75Hz	60Hz	90Hz	60Hz	60Hz
Refresh - 1600x1200	70Hz	Not supported	Not supported	75Hz	Not supported	Not supported
Modem manuf.	Diamond	Diamond	GUC	Generic 56K	Generic 56K	Pace
Modem model	Supra Express 56K	Supra Express 56K	✗	✗	✗	56K
Modem standard	K56flex	K56flex	V.90	V.90	V.90	K56flex
Other hardware	-	Steering wheel	STB Blackmagic Voodoo2, joystick	Microsoft Sidewinder	Noise cancelled headset microphone	Microphone
Other software	-	-	Gateway games bundle, MS Home Essentials	Games bundle	Lotus SmartSuite, Corel Draw 7, IBM ViaVoice, IBM Antivirus	Quicken 6.0 SE, MS Works, Encarta 98
Standard warranty	1 yr on-site	1 yr RTB	1 yr on-site	1 yr RTB, parts & labour	1 yr collect & rtn with parts & labour	1 yr on-site
Warranty options	Two more years at 8% of PC's cost	1 yr on-site for £39	3 yrs on-site	-	Up to 5 yrs collect & rtn with parts & labour	3 yrs on-site
Technical support	0181 810 7441	0171 830 0486	0800 802000	0181 208 4700	0990 134725	0181 830 1100

Table of features

Manufacturer	Mertec Computers	Tiny Computers	Dabs Direct	Elonex	Linear Direct	Roldec Systems
Model Name	XM300-K2	Family Bonus	Atlantis Home Value	MLX-6333/I	Linear Vantage XL	Puma
Price (ex VAT)	£850	£899	£595	£595	£595	£595
Price (inc VAT)	£999	£1,056	£699	£699	£699	£699
Telephone	01792 473700	0800 821333	0800 558866	0181 452 4444	0181 408 9888	01902 456464
Web address	www.mertec.co.uk	www.tiny.com	www.dabs.com	www.elonex.co.uk	None	www.roldec.com
Processor	AMD K6-2 300	Intel Celeron A 333	Intel Celeron 266	Intel Celeron A 300	Intel Celeron A 300	AMD K6-2 333
RAM supplied	64Mb	32Mb	32Mb	64Mb	64Mb	64Mb
RAM type	PC100 SDRAM	66MHz SDRAM	66MHz SDRAM	66MHz SDRAM	66MHz SDRAM	PC 100 SDRAM
DIMMs occ/free	1/2	1/2	1/1	1/2	2/0	1/2
HD size	6.4Gb	4.3Gb	2.1Gb	6.4Gb	4.3Gb	4.5Gb
HD access time	9ms	10ms	11ms	9ms	10ms	9ms
HD interface	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA	Ultra DMA
Motherboard	Soyo SY-SEMA	Microstar MS 6119	Abit AH6	Microstar MS 612B	KTX M59TC	Microstar
Chipset	ETEQ 82c 66 38	Intel 440BX	Intel 440LX	Intel 440EX	ALI M1531 B1	ETEQ 82c 66 38
L2 cache/max	1Mb/1Mb	128Kb/128Kb	None	128Kb/128Kb	512Kb/512Kb	512Kb/512Kb
Free 3.5/5.25in bays	1/2	1/1	1/3	1/1	1/1	2/1
PCI/ISA/shared slots	5/2/1	4/3/1	3/2/0	2/1/1	4/3/0	4/3/1
USB/ser/par/PS/2	2/2/1/1	2/2/1/2	2/2/1/2	2/2/1/1	0/2/1/1	2/2/1/2
CD-ROM manuf.	LG Electronics	Panasonic	Mitsumi	Vuego	Cyberdrive	Asus
CD-ROM model	CRD-832OB	CR-588-B	FX3200	CD 632A	Cyberdrive 32	CD-S400
CD-ROM speed	32X	32X	32X	32X	32X	40X
CD-ROM interface	EIDE	Ultra DMA	EIDE	EIDE	EIDE	EIDE
Sound card manuf.	Creative Labs	Yamaha	Pine	Yamaha	Creative Labs	Diamond
Sound card model	SoundBlaster 128 PCI	XE-32	Schubert 3D Max	YMF 715	Vibra 16S	Sonic Impact S90
Speakers	ADI 5P2000	Tiny CPR 50	Logic 3 Maxim 60W	Creative CSW20	Creative Labs	Arowana
Graphics card manuf.	Matrox	ATi	S3	Diamond	ATi	Diamond
Graphics card model	Millennium G200	3D Charger AGP	Virge GX2	Viper V330	All-in-Wonder Pro	Viper V330
Graphics interface	AGP	AGP	AGP	AGP	PCI	AGP
Graphics RAM/Max	8Mb/16Mb	4Mb/4Mb	4Mb/4Mb	8Mb/8Mb	8Mb/8Mb	4Mb/4Mb
Monitor	ADI 5P	Tiny rebadge	Belinea 10-40-10	Elonex rebadge	Relisys RE5188	ADI 4P
Monitor size (in)	17in	15in	14in	14in	15in	15in
Refresh - 800x600	85Hz	75Hz	75Hz	120Hz	85Hz	85Hz
Refresh - 1024x768	75Hz	65Hz	60Hz	120Hz	75Hz	75Hz
Refresh - 1280x1024	60Hz	Not supported	Not supported	100Hz	Not supported	Not supported
Refresh - 1600x1200	Not supported	Not supported	Not supported	85Hz	Not supported	Not supported
Modem manuf.	Generic 56K	E-tech	Dabs	E-tech	LT	Generic 56K
Modem model		56K Fax Modem	56K voice	56K Fax Modem	PCI 56K	56K Fax Modem
Modem standard	V.90	K56flex	V.90	K56flex	V.90	V.90
Other hardware	HP DeskJet 670C	Umax 610P	Logic 3 joystick	-	-	-
		Fuji digital camera,				
		Epson Stylus 300				
Other software	Encarta 98, Scenes, 3D	-	-	MS Works	Lotus SmartSuite	Lotus SmartSuite,
	Movie Maker, MS Golf,					Screamer2,
	MS Works 4, Corel					PC Check
	Draw 4, Cinemania 97					
Standard warranty	5 yr RTB, 2 yrs parts	1 yr RTB	1 yr on-site,	1 yr RTB	1 yr RTB	5 yrs RTB,
	& labour, 3 yrs labour		4 yrs labour			2 yrs pts & lab
Warranty options	1 yr on site	5 yrs on-site, from £79	3 yrs on site	5 yrs RTB	2 more yrs labour only	2 yrs parts only
Technical support	01792 473700	0800 821333	0800 558866	0181 452 6666	0181 408 9888	01902 456464

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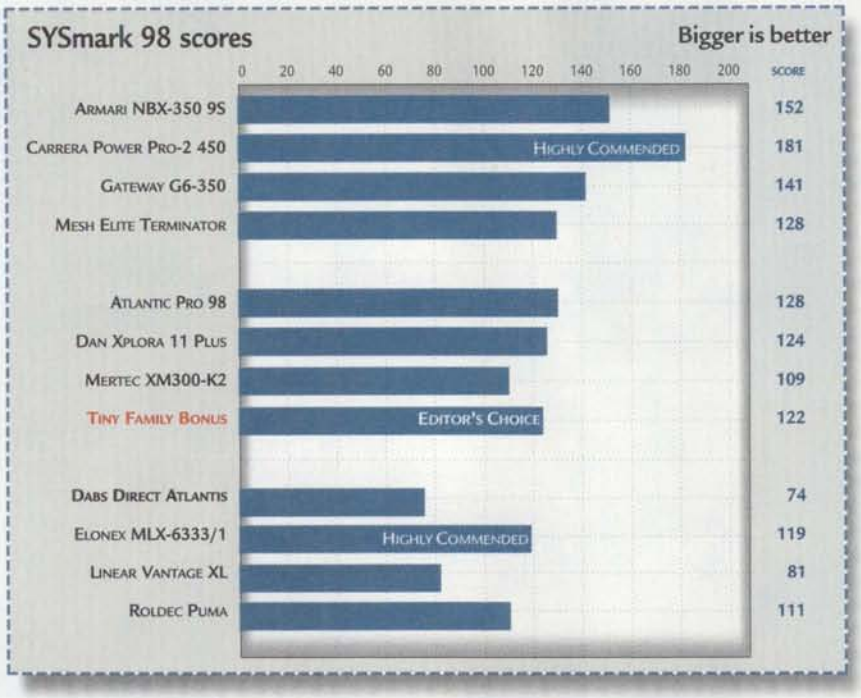
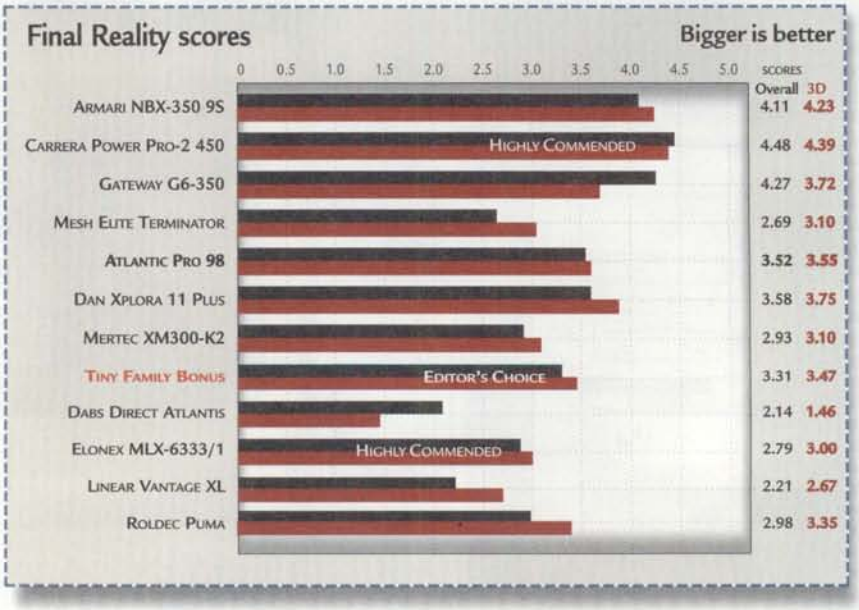
KESTREL

PCW Labs Report



These results show, more than anything else, the need for a good processor when running 2D office applications. This is most clearly seen in the Armari and Carrera machines. Both have the same graphics card (a Diamond Viper V550 with 16Mb of graphics RAM) but the Armari had a slower processor (PII 350) and more system RAM (128Mb), while the Carrera had a PII 450 and just 64Mb of RAM. However, the processing power of the Carrera won through, suggesting that you do not need 128Mb of RAM to run Word and should instead go for the fastest processor you can. We were also disappointed to see the AMD processors doing so badly in comparison to both the PIIs and the Celerons.

In these tests, a good processor seems to have been secondary to the graphics card and RAM. The Armari and Carrera were very close both in 3D and overall scores. Not surprisingly, they both have the same graphics card with the same amount of graphics RAM. We can see the clear advantage of having 16Mb of graphics RAM compared to the 8Mb included in most of these systems. However, the extra RAM in the Armari seems to have made more of an impression in this test than in the 2D tests, almost catching the Carrera with its faster processor.



Overall score ■ 3D score

How we did the tests

We ran two sets of tests on the machines: **Final Reality** to test graphics capabilities, and **SYSmark 98** to test the speed of the machines when running 2D office applications. The SYSmark test measures the speed of the PC running eight common office applications and the time it takes to perform a variety of tasks in each application. Each test is run three times to ensure consistent results. Performance depends on processor speed, RAM, graphics card and disk I/O. As the tests are based on business software packages, SYSmark scores accurately reflect how the machine will perform in a real-world situation. Final Reality is a suite of tests designed to gauge the processing power of the 3D accelerator on your graphics card, 2D image processing and AGP. It runs under Windows 95/98 and DirectX 5 and uses a 3D engine developed by Remedy. It supports Direct3D and looks at how the graphics accelerator handles the kind of data it would have to process when you are playing a game. The visual appearance factors are weighted in importance and combined with the overall processing speed to produce an overall mark.

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Editor's Choice

A Christmas stocking-full of PCs for all budgets.

Apart from a couple of exceptions, there are some factors common to all the systems in this group test. The quality of construction of these PCs is excellent. They have high-quality components and most are easily upgradeable. For instance, we were pleasantly surprised to find powerful 333MHz processors inside PCs costing less than £700. And, the vendors have included large hard drives, powerful graphics cards and good sound cards. Many of these systems would keep you happy for a long time to come.

In the games system category, the **Carrera Power Pro 2-450** stands out. In addition to being a speed monster, the quality of its internal components far outstrips others. The SoundBlaster Live! audio card is a good example. With its four-speaker surround-sound output it is a perfect gamer's card, and its impressive MIDI synthesis and so turns the Carrera PC into a miniature home studio. Similarly, the fast 450MHz Pentium II processor is a good companion to the powerful Diamond Viper V550 graphics card. Carrera has also thoughtfully included a steering wheel with force feedback to cap a well-equipped gaming system.

The quality of construction of these PCs is excellent

In the £1,000 price bracket, the **Tiny Family Bonus** system caught our eye. Tiny claims to be the UK's largest PC retailer and this system is representative of the company's dedication to the mainstream consumer market. While not lacking in quality components, as shown by the inclusion of the 333MHz processor and upgradeable motherboard, the Tiny PC has no less than three useful peripherals bundled free with it. The Umax 610P scanner is one of the best in its price range and came top in our scanners group test in the September '98 issue. The Epson Stylus Color 300 printer, although not that fast, produces decent-quality colour images and text. The Fuji DX-5 digital camera has a decent image resolution of 640x480 and comes with a 4Mb flash memory cartridge.

The sub £700 budget PC segment is one of the fastest-growing sections of the PC market. The Elonex MLX-6333/1, despite its rock-bottom price, does not skimp on any necessary component. With its 300MHz processor and a large 6.4Gb hard drive, this system's performance is actually better than that of many others costing far more.

Christmas is a time when buyers look for bargains. In the realm of PC sales, there is no better bargain than the **Tiny Family Bonus** system. Its build quality is as good as the best in this group test, and with three high-quality bundled peripherals, the Family Bonus system is excellent value for money. These factors, along with the Tiny's high upgradeability, make it a fitting choice for our **Editor's Choice** award. The Tiny PC, more than any other system, would be the ideal Christmas gift.

The Carrera and Elonex systems also deserve an honourable mention. While the former is a speed demon and a gamer's dream, the latter delivers high performance at an enticing price. For these reasons, the **Carrera Power Pro-2 450** and the **Elonex MLX-6333/1** are worthy winners of our Highly Commended awards.

▲ TOP TINY FAMILY BONUS
MIDDLE CARRERA POWER PRO 2-450
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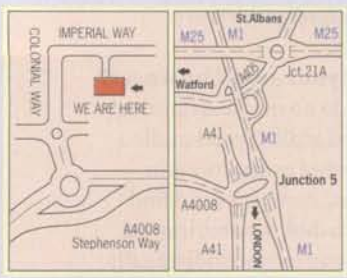

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THE GOVERNMENT MAY BE OPTING TO WAIT AND SEE HOW THE EURO AFFECTS US, BUT AS JAMES TAYLOR POINTS OUT, BUSINESS CANNOT ALLOW ITSELF THAT LUXURY.

European horizon

Whether you welcome it or wish it would just go away, the euro looks like it's here to stay. Its official début is 1st January 1999, when it becomes the currency of the participating Member States of the European Monetary Union (EMU). Its exchange rate will be determined by the European Council with the participation of the European System of Central Banks (ESCB) and the European Commission. Interest rates will be set by the European Central Bank (ECB).

Like the pound or dollar, the euro is not normally capitalised. Its symbol is a stylised letter "e" (*illustrated, above*) used in front of amounts, just like £ or $ signs. One euro will be divided into one hundred cents. The Government seems not to have made up its mind whether its plural is *euros*, like pounds, or *euro*, like sterling, because it's using both.

During a transitional period running from 1st January 1999 to 31st December 2001, the euro will also be divided into "temporary national currency units" – deutschmarks, francs, lire and so on, according to their conversion rates. On 31st December 2001, the participating national currencies will cease to exist and the euro will be used throughout the EMU.

The EMU is made up of those European Union (EU) member states that meet the complicated convergence criteria for changing to the single currency and are likely to include Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain. Those countries will therefore each introduce a dual-currency system on 1st January 1999, phasing out the use of their local currency over the subsequent three years.

The UK is not among those adopting the euro, at least for the time being, and although the present Government is in favour of joining, it has promised a national referendum first, the outcome of which is still not certain. Denmark and Sweden have also decided not to join immediately. Greece did not meet the economic criteria (anyway, in Greek, *euros* means "urine"). In the UK, then, 1st January 1999 merely sees the introduction of a new foreign currency.

How will it affect your small business?
Well, if you currently do no overseas business, you will not be affected at all. If you handle a relatively small number of transactions in participating members' currencies and find yourself being asked to deal in euros instead, you can convert each transaction individually. Making a payment will typically mean completing a standard bank form specifying the euro as the paying currency. The debit will appear on your (present) sterling account as usual.

THE ART OF EUROGLYPHICS

The problem with a brand-new, made-up currency is that its symbol also has to be brand-new and made-up. Consequently, it does not appear in any previous computer font or on any keyboard.

Windows 98, NT 5.0 and CE (later versions) users will find the euro currency symbol supported in Times New Roman, Arial and Courier New.

Windows 95 or NT 4.0 users can download a fix from Microsoft's web page. All of these allocate the euro symbol to ALT Gr+4 in the UK. Alternatively, insert the euro symbol via Insert/Symbol from the menu, looking under Font "normal text" and subset "currency symbols".

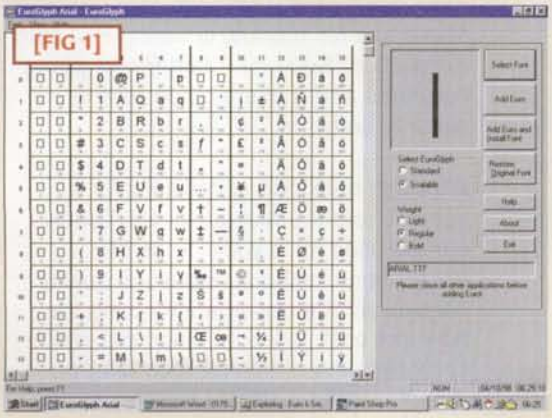
Office 95 and Office 97 can both recognise the euro character. To print it, though, Office 95 needs either updated printer fonts (talk to your printer manufacturer) or to be set to print fonts as graphics by changing the Printer Options box, which considerably slows down printing. In Office 97, Word 97 can handle the euro symbol automatically. Excel 97 needs its registry settings to be changed, while PowerPoint, Access and Outlook behave like Office 95. Microsoft has no plans to provide updates for Windows 3.x, Windows for Workgroups 3.x and prior versions, Windows CE before version 2.1, nor for the MS-DOS operating system. If you're using those, you need to look elsewhere.

[FIG 2]

Euro solution

One company offering a solution is EuroType, whose EuroGlyph software will add the euro symbol to any TrueType font. EuroGlyph has to add the euro symbol separately to every font you want to modify [Fig 1] including styles like bold and italic. Having chosen your font, the software selects a default character to be replaced by the euro, showing it in the top right-hand box.

Or, you can pick your own if you prefer. You might, for instance, dedicate a font you don't normally use and replace its pound sign. You have the choice of the official "standard" character, or a scaleable option which adjusts the character to match the font in use and ensures correct tabulation. This is important where figures appear in columns and tables and accurate vertical alignment is essential. It is easiest to let the software add the euro symbol to the selected font and install it automatically, ready for use. After rebooting your computer, you can see the substitution.


[FIG 1]

Now you have your euro symbol, you want to be able to use it. In Word97 you can use Insert/Symbol from the menu, select the euro character, select the Insert button, and there you have it. Alternatively, you can assign it to a key, or keys, so that instead of pressing SHIFT+3 for the £, say, you can press ALT+3 for the symbol [Fig 2]. Finally, you can enter it by typing in its code, in this case holding down ALT while typing 124 on the numeric keypad, which then also gives you the euro.

• **Neither the** Microsoft updates nor the EuroGlyph changes are transportable. Trying to view or print any resultant files on another machine won't work unless it has the same font changes installed.

PCW CONTACTS

EuroGlyph *costs £54.95 (inc P&P). Available direct from EuroType 01442 824130* www.eurotype.com
Microsoft update *freely downloadable from* www.microsoft.com/technet/topics/euro

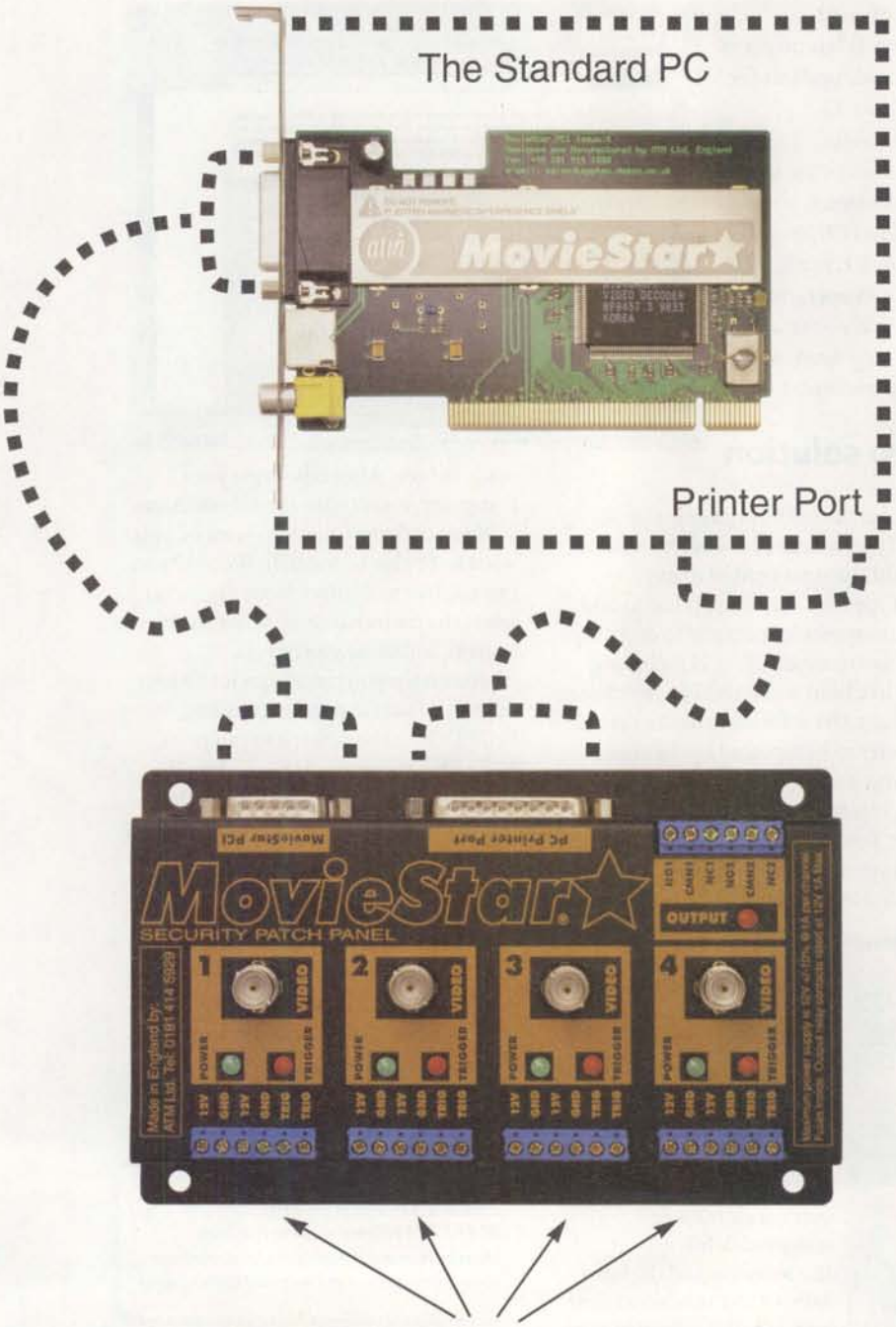
Payments received, whether electronically or by cheque, will be converted and credited to your sterling account.

If you make or receive a large number of euro payments, you can open a euro account in addition to your sterling account. An incidental benefit is that you can then combine all the balances of your "transitional" currency accounts to simplify account reconciliation. Due to rounding effects, converting national currency into the euro, then later back into national currency (or vice-versa), may in some cases result in a difference between the initial and final amounts. It is better to leave conversions, during the transitional period, to your bank. Some UK-based firms, including Philips, IBM, Siemens and the Rover Group, have announced that they will start to use the euro for invoices and payments.

If, or perhaps when, the UK commits itself to monetary union, all businesses, whatever their size, will have to change their budgetary, accounting and fiscal systems, including salaries, prices, social security contributions, VAT payments, charges, benefits... the list goes on.

THIEF CAPTURED BY PC

WORLD FIRST



Connect standard alarm sensors to these screw terminals in order to trigger AVI movie recording to hard disc. Devices such as PIR (Passive Infra Red) detectors, invisible beams, pressure mats and door & window contacts are suitable.

We think the MovieStar Security Patch Panel is the only product available that allows you to trigger AVI movie capturing using standard alarm sensors.

The system gives you four camera channels each with a sensor input, for PIR's, pressure mats, invisible beams or door contacts. Upon each trigger event the software switches the MovieStar card to the correct camera input and starts recording an AVI to disk for a pre-determined length of time. This AVI file is time and date stamped, so you know who was doing what and when.

And unlike timelapse VCR's you will get a full resolution digital PAL image of 768x576 pixels without degradation and a response time of 0.1 of a second.

The Security Patch Panel has a programmable output relay so that any of the channel triggers can cause the output to be activated. When wired to another alarm panel this can raise the alarm as a simple alarm sensor would. Alternatively it can be linked to a phone dialler to allow remote site monitoring.

There is a full manual covering PCI card installation, Security Patch Panel wiring diagrams and a users guide for the security software.

Although designed specifically for a security role the MovieStar SPP pack can be used for a wide range of applications including industrial quality control, wildlife observation (using the new low cost, low-light black and white cameras) and of course recording-on-demand using a simple switch.

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** Includes Security Patch Panel, leads and security software. Suitable for existng MovieStar owners only.

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Accounting and the euro

Implementing the systems necessary for both the transitional, dual-currency phase and for the complete changeover to the new currency, will need a considerable amount of time. The principal problem is technical: most UK-specific accounting and management software is currently unable to handle full euro accounting as laid down by the European Commission.

The EC's regulations cover two major considerations: how conversion between currencies will be calculated, and how rounding should be handled. Both will have a significant impact on your accounting software. Participating currencies can only be exchanged using strict rules, known as triangulation, enforced by publishing conversion rates for the euro against EMU countries' national rates. Thus, there will be no exchange rate for the franc against the deutschmark. There will be a conversion from the franc to the euro and from the euro to the deutschmark. After the final conversion from the euro to the EMU national currency, you can round to two decimal places (0.00499 down to 0.00, or 0.005 up to 0.01).

The conversion rules are quite specific, including expressing the euro in terms of each of the national currencies to six significant figures (counted from the left and starting with the first non-zero figure) and neither rounding nor truncating during conversions. You cannot use inverse rates derived from the conversion rates.

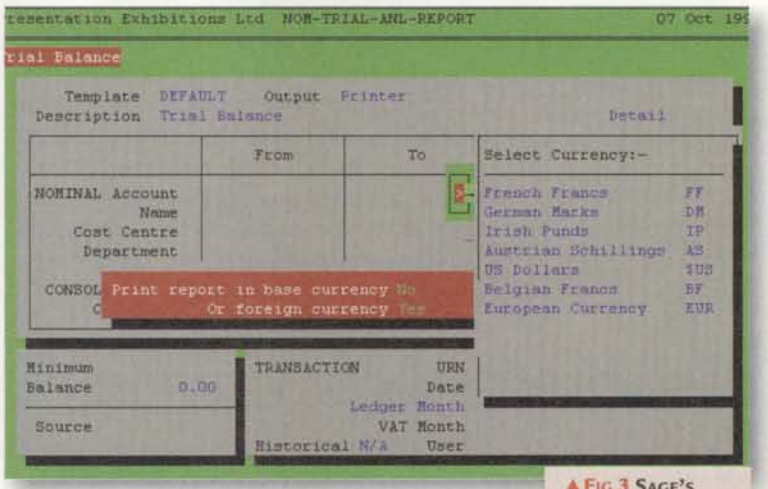
The conversion and rounding rules do not specifically describe the conversion from a participating national currency to a third currency (one that is not taking part in EMU). However, it seems to be accepted that they will follow the same triangulation rules, so that to exchange the pound against the franc you would first convert pounds to euros, and then convert euros to francs.

Clearly, during the transitional stage, your accounting software must be multi-currency and able to operate in at least sterling and euro simultaneously. You can then use euros for particular order, invoice and payment transactions and let your software process them entirely in euros at the same time as other transactions are being handled, in a separate account, in sterling. Of course, you would have to convert from one to the other for reports such as profit and loss, and balances. If the UK goes into full monetary union, or you do a lot of business with EMU countries, your software must be able to handle full triangulation.

If you think you are going to get caught up in euro transactions, you need to change your account currency at an appropriate year-end. Once the old year has been closed, all the balances to be carried forward will just need to be converted, paying special attention to items still open. Long-term budgets and forecasts are probably best done from scratch, in euros. All your previous years' results will also need to be converted if you use them for comparison. That just leaves you to decide when to convert to using euros internally. For most small businesses, it's unlikely to be before the UK joins, if ever. That will have the advantage of letting others wrestle with clarifying the regulations and sorting the bugs out of the software. It will also not distract you from any Year 2000 problems that might be lurking.

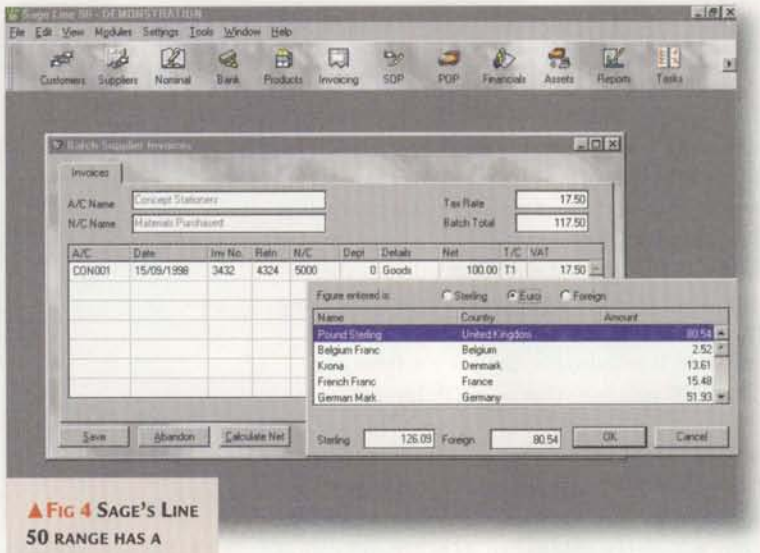
Soft solutions

It is unlikely that personal or very small business software, such as the likes of Quicken, Money or Solo, will ever be able to handle full triangulation conversions although you will be able to use those for the single euro currency if the UK joins the EMU, of course. Some publishers of accounting software for small- to medium-sized businesses will not have their software ready for full triangulation by 1st January 1999 either, although those which are already multi-currency will be able to manage euro accounts, leaving you to convert manually.



▲ FIG 3 SAGE'S LINE 100 RANGE CAN PRODUCE REPORTS IN EITHER YOUR BASE CURRENCY OR A CHOSEN FOREIGN CURRENCY

Looking at individual software publishers shows varying states of readiness, although all the big names are planning new versions for 1st January 1999 or before. No firm has final prices yet, so perhaps they're waiting to price in euros? ☛ **Sage** already has a multi-currency application (formerly called Sovereign) in its **Line 100** product [Fig 3] with extra euro-compatible features promised. These include storing all currency exchange rates to six significant figures, converting between the euro and EMU member states' currencies, calculated using triangulation rules, applying exchange rate and rounding differences according to EU legislation, and producing financial statements in euros. And, payments in one currency will be matched



▲ FIG 4 SAGE'S LINE 50 RANGE HAS A EURO CALCULATOR

against invoices in another. Also, existing individual customer and supplier accounts will be converted to euro-based accounts and the program can handle euro exchange gains and losses. Sage's view is that currency conversions will follow triangulation rules when either one or both of the currencies involved are euro zone currencies. Exchange loss and gain is posted to the nominal ledger. Rounding discrepancies are accounted for separately from exchange loss or gain.

Although Sage's Line 50 for Windows version 5 (formerly Sterling) is not a multi-currency product, it will include a euro calculator [Fig 4] which will allow you to convert values between your base currency and the euro. You can then print euro totals on a sales invoice which has been entered in your base currency, or convert a euro payment to your base currency, before allocation against the relevant invoice.

Access Accounting also has existing multi-currency products that can be used to accommodate some of the demands of accounting for the euro. It includes the ability to handle multiple exchange rates per currency, clear foreign currency invoices with a payment in a different currency, and allocate payments against invoices in a foreign currency. Extra functionality planned includes reporting in euros in the three main ledgers, historical and comparison reporting in euros, and the ability to retain and revert to your local trading currencies while trading and reporting in euros, just in case European Monetary Union does not hold.

MAP Pastel is designing a euro version of its **Pastel Partner** software, which is already multi-currency, with some EU processing in terms of EU sales and purchase reports, as well as automatically exempting EU sales and purchases from tax. To this will be added the ability to include tax on foreign currency transactions. But not all EU members subscribe to EMU. Pastel's philosophy is to shield users from extraneous features where possible and it will be necessary to "opt in" to Pastel's EU processing menu – you are not obliged to enable multi-currency processing. If your customers, suppliers, bank accounts, and your own company, trade only in euros, multi-currency processing is unnecessary.

TAS is planning new euro-compliant products, including an entry-level system with a conversion calculator. Also included is a reissue of **TAS Books for Windows**, with multi-currency and triangulation capability, and **TAS Business Controller**. Later, we can expect to see a much-extended version which is likely to encompass dual-base currency.

• *This article reflects the facts as well as the conjecture which was current at the time of writing (mid- October, 1998). Such are the current uncertainties surrounding the global economy that the situation may have changed by the date of publication.*

THE ACCOUNTANTS' VIEWPOINT

Voice of the industry, BASDA (Business and Accounting Software Developers Association), representing the UK's leading accounting software developers, has produced its own "White Paper" on the implications of the changeover to the euro for UK businesses. Included is an update of the effect on banking, by the British Bankers Association; implications for accounting, by the Institute of Chartered Accountants in England and Wales; and how EMU will impact on an organisation, by IBM. The "White Paper" also includes the latest version (2.2) of the *BASDA EMU Specification and Accreditation Standard*. The "White Paper" costs £50. BASDA is also lobbying HM Customs & Excise for a change in the rules which insist that while UK companies can account in euros and submit their returns in euros to Companies House, the UK VAT authorities require all of their information to be in sterling. BASDA has also developed triangulation test data to help users test the compliance of their financial and accounting software systems.

PCW CONTACTS

Access Accounting *01206 322575* www.access-accounts.com
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66-PII-300	Intel PII 300	£1340	£1410
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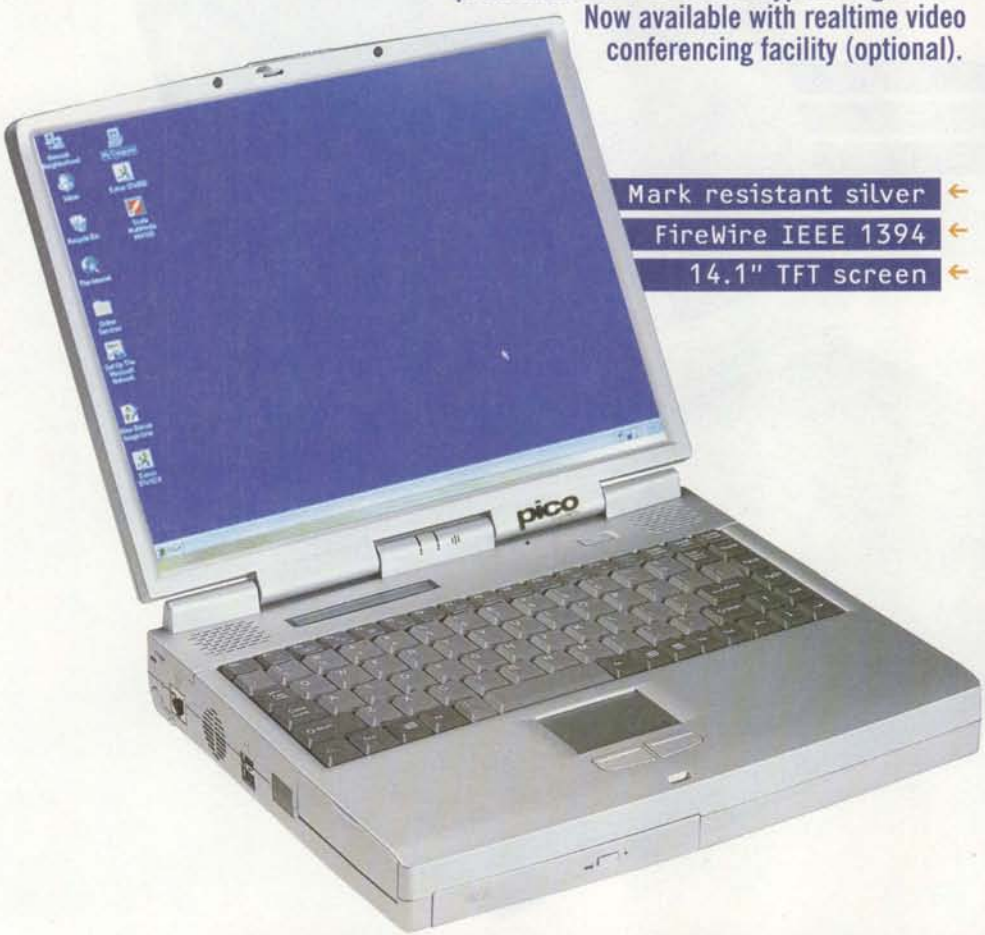

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PCW Christmas Quiz

As the long winter nights draw in, there's nothing better than a fun festive quiz to test the old grey matter. Of course, being a computer magazine we're going to have to ask you a load of technology questions instead, but you get the general idea. In the tradition of all good competitions, we've got a great incentive for trawling through our festive 50 brainteasers. Our first prize is nothing less than a superb Canon Powershot A5 digital camera worth £500, while 20 lucky runners-up will each receive a copy of Microsoft Encarta 1999 Reference Suite, price £99 apiece. To stand a chance of winning, all you need to do is answer as many of the following 50 questions as possible. The entry with the most correct answers wins the camera, and the next 20 get the reference suites. Good luck!

How to enter

Please mark your answers directly on these pages or a photocopy, and, remembering to include your name and address, pop them in an envelope and then send them to:

Gordon "Santa" Laing
PCW Christmas Quiz
VNU House
32-34 Broadwick Street
London W1A 2HG
Last entry day: 4th January 1999

Rules of entry

This competition is open to readers of *PCW*, except for employees (and their families) of VNU Business Publications. The Editor is the sole judge of the quiz and his decision is final. No cash alternative is available in lieu of competition prizes.

Section 1: Famous faces

You know the name and have heard the gossip, but what do they actually look like? Identify the following five people from their photo and an industry clue. Choose your answers from the list of names below:

1. This man has been called (notably by his own publicists) the Bill Gates of the East.

2. This co-founder of a US giant says paranoia is the basis of his business philosophy.

3. This man popularised the term "pervasive computing" — but not enough to save his job, in 1995.

4. This Englishman should profit from the trend to mobile devices.

5. F...F...F...F... er, find the man who recently pulled off one the biggest ever company takeovers.

Choose from the following names:

A: Yoshinori Kobe of Matsushita **B**: Andy Grove of Intel **C**: The late Gary Kildall of Digital Research **D**: Hermann Hauser of Acorn and Advanced RISC Machines **E**: Tsutomu Kanai of Hitachi **F**: Lee Kun-Hee of Samsung **G**: Robin Saxby of Advanced RISC Machines **H**: Eckhard Pfeiffer of Compaq **I**: Stan Shih of Acer **J**: Ray Noorda of Novell **K**: Michael Cowpland of Corel **L**: Bob Frankenberg of Novell **M**: David Potter of Psion UK **N**: Larry Ellison of Oracle **O**: Jim Clarke of Netscape.

Section 2: True or false?

It's very simple: tell us which of the following statements are true, and which are false.	True	False
6. There is a vacuum in a hard disk.	❑	❑
7. The anode in a CRT monitor runs at 5000V.	❑	❑
8. Each USB device requires 100mA of power to be configured.	❑	❑
9. L2 cache speed on a Celeron is faster than that on a PII of an equivalent clock rating.	❑	❑
10. To be sold legally in this country, all PCs have to pass CE testing.	❑	❑

Section 3: History

In the first of our historic sections, rack your brains or search the library for clues on the following:

11. What, or rather who, is the link between a reputedly incestuous Romantic poet and a military programming language?

_____

Science and Society Picture Library

12. William Gibson named a novel after this mechanical precursor to the computer (*left*). What was the latter called?

_____

13. In which year was the IBM PC launched? _____

14. Microsoft's new PC operating system was remarkably similar to the then market-leading OS, written by Digital Research. What was this called?

_____

15. Attending this year's 50th anniversary of the first stored-program computer, built at Manchester University, was the first modern programmer. What is his name?

_____

Section 4: Game on!

This is a quick quiz for all you game-gurus out there. Below are the names and pictures of five characters that have starred in top PC games this year. All you have to do is match them up with the game titles listed:

16. Red Lotus

_____

17. Gex

_____

18. Edmond Lucy Fentible

_____

19. Max Damage

_____

20. Adam Crowley

_____

Choose from the following games:

A: Starship Titanic **B**: Deathtrap Dungeon **C**: Nightmare Creatures **D**: Enter the Gecko **E**: Carmageddon II

Section 5: Industry news

It's not just politics that has a penchant for surprise movers and shakers, scandal and dirty deeds. All that can be had in the IT industry too! So we thought it would be fun, as part of this quiz, to test your knowledge on industry news. Here are five questions based on events in the IT sector over the last year:

21. In the Microsoft anti-trust trial, David Boies, aka the "antitrust wizard", has been brought in as special prosecutor. What other famous anti-trust trial did Boies take part in? We want to know which company he defended and how long the trial lasted for. And one more little teaser on the Microsoft front: what's the link between the Microsoft trial and President Clinton?

_____

22. Which networking company has recently been scooped up by giant chipmaker Intel, and what is that networking company's link to Scotland?

_____

23. The "new" millennium problem is having to cope with a new phone numbering system. What is the exact date the numbering system is due to come in to effect?

_____

24. Where can you fill your trolley with PCs and an ISP connection?

_____

25. We all know about the new iMac from Apple. But what does the "i" in iMac stand for? Is it:

a) Intranet, **b)** Internet, **c)** Innovative, or **d)** Incomplete? Sorry, I mean **e)** Ideal? _____

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Section 6: Acronymns

We all use acronyms every day, but how many of us know what they really stand for?

26. ACPI _____ **27.** ATAPI _____

28. CMOS _____ **29.** LVDS _____

30. RADSL _____

Section 7: Name that font

There's more to fonts than just Arial and Times New Roman. Try to name the following examples to see if you're our type. Take your pick from the list below:

31. Merry Christmas ❑ **32.** *Merry Christmas* ❑ **33.** Merry Christmas ❑

34. MERRY CHRISTMAS ❑ **35.** Merry Christmas ❑

Choose from the following fonts:

A: Palatino **B**: Courier **C**: Zapf Chancery **D**: Meta **E**: Futura **F**: Dolce Vita **G**: Mekanik **H**: Garamond **I**: Elli **J**: Helvetica

Section 8: Who did what, and when?

Everyone's heard of Bill Gates and Larry Ellison, but how much PC history do you have at your fingertips?

36. Who missed an important meeting with IBM in 1980 and changed the course of William Gates's life? _____

37. Who invented the mouse, and which Palo Alto research facility did they go on to work for? _____

38. + ? = Java. Name the person and Java's previous incarnation. _____

39. Who invented the Apple II with this man? _____

40. Who is the father of the original 1979 "killer app" and what was it called? _____

Section 9: Bandwidths

One for the true winter anorak wearers. If you thought the acronyms were too easy, try telling us what the bandwidth or thoughputs of the following standards are – and make sure you get your units right!

41. USB _____ **42.** Bluetooth _____ **43.** SCSI U2W _____

44. Dolby Digital 5.1 on DVD or LD _____ **45.** ISDN D channel _____

Section 10: Robots and computers in the movies

Finally, no computer quiz would be complete without a few questions on famous computers and robots on the small and silver screens.

46. What was wrong with the R2 unit whose demise allowed R2-D2 to join C-3P0 and work for Luke Skywalker's uncle?

_____

47. John Connor uses a handheld computer to steal cash from ATMs in Terminator 2. What is the make and model?

_____

48. (i) What does the indestructible car KITT's name stand for? (ii) Name his prototype.

_____

49. What is the name of Commander Data's brother?

_____

50. Who were the makers of Gromit's Techno Trousers?

_____

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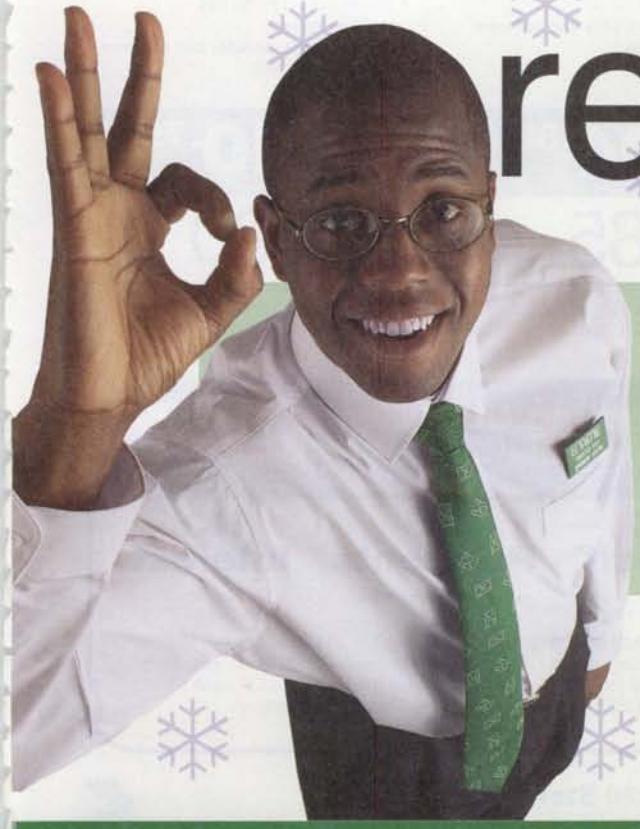

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Alvis Retail Park, Holyhead Road
Tel: 01203 595 659
Derby
Bradshaw Retail Park, Bradshaw Way
Tel: 01332 383 006
Dudley
Towngate Burnt Tree Island, Birmingham Road
Tel: 01384 236 040
Leicester
Burton Street
Tel: 0116 253 2438
Lincoln
Canwick Road
Tel: 01522 513 055

WEST & SOUTH WEST
Bristol
Newfoundland Street
Tel: 0117 955 2399
Exeter
Exeter Retail Park, Marshburton Road
Tel: 01392 495 898
Gloucester
The Island Site, Westgate Street
Tel: 01452 331 103
Swindon
Manington Retail Park
Tel: 01793 527 663
Taunton
Riverside Retail Park
Tel: 01823 443003

SOUTH & SOUTH EAST
Aylesbury
Vale Retail Park, Vale Park Drive
Tel: 01296 421 116
Banbury
Southam Road
Tel: 01295 263 588
Basildon
Great Oaks
Tel: 01268 273 733
Basingstoke
Brighton Hill Retail Park
01256 331 324
Bedford
The Interchange Retail Park, Ampthill Road
Tel: 01234 840 881
Cambridge
393/395 New Market Road
Tel: 01223 361 266
Charlton
Charlton Penisular Retail Park, Bugsby Way
Tel: 0181 305 2123
Chelmsford
The Meadows, 36-40 Springfield Road
Tel: 01245 268 401
Colchester
The Tollgate Centre
Tel: 01206 561 806
Harlow
St James Centre, Edinburgh Way
Tel: 01279 410 711
Hayes
Hayes Bridge Retail Park, Uxbridge Road
Tel: 0181 573 1655
Horsham
42-46 Worthing Road
Tel: 01403 256 682
Luton
10/20 Castle Street
Tel: 01582 432 126
Milton Keynes
Grampion Gates
Tel: 01908 394 473
Northampton
67/83 Bridge Street
Tel: 01604 636 277
Newbury
Greenham Road
Tel: 01635 32633
Oxford
14-16 Park End Street
Tel: 01865 245 653
Peterborough
Boulevard Retail Park, Maskew Avenue
Tel: 01733 315 810
Portsmouth
Victoria Retail Park, Flathouse Road
Tel: 01705 755 295
Reading
65 Caversham Road
Tel: 0118 950 2662
Slough
105 Farnham Road
Tel: 01753 526 602
Solihull
Stratford Road, Shirley
Tel: 0121 744 3177
Southampton
Western Esplanade
Tel: 01703 631 383
Watford
114 St Albans Road
Tel: 01923 248 688

LONDON (M25) AREA
Colindale
339 The Hyde, Edgeware Road
Tel: 0181 200 8938
Epsom
31-37 East Street
Tel: 01372 739 668
Old Kent Road
651/657 Old Kent Road, Southwark
Tel: 0171 277 8144
Park Royal
North Circular Road, Hanger Lane
Tel: 0181 838 1975
Tottenham
Tottenham Retail Park, Broad Lane
Tel: 0181 801 5243
Western Avenue
Tel: 0181 752 0789

TIME COMPUTER SYSTEMS store in POWERHOUSE

WALES
Cardiff Bay
Unit 1G, Ferry Road, Cardiff Bay Retail Park
Tel: 01222 232 453 *(near ASDA)*
Cardiff Newport Rd
Unit B, Sega Retail Park, Newport Road
Tel: 01222 461 714 *(near Allied Carpets)*
Newport - opens 2nd November
Tel: 01633 817169

MIDLANDS
Cannock
Unit 10, Orbital Retail Centre
Tel: 01543 468 869 *(near Sainsburys)*
Coventry
Unit 3, Gallagher Retail Park, Stoney Stanton Rd.
Tel: 01203 663 588 *(near Comet)*
Derby
Unit 2 The Kingsway Retail Park
Tel:01332 349443 *(near Comet)*
Huntingdon
Unit B Huntingdon Retail Park, St Peters Road
Tel: 01480 459 392
Solihull
Unit 3 Sears Retail Park, Marshall Lake Road
Tel: 0121 733 1936 *(near Comet)*
Birmingham/Stechford
Unit H, Flaxley Parkway, Stechford Retail Park
Tel: 0121 783 6517
Stoke
Festival Park, Etruria, Stoke on Trent
Tel: 01782 279 895
Tamworth
Unit H, Ventura Retail Centre, Bitterscotte
Tel: 01827 63963
Telford
Unit 3, Telford Forge Retail Park, Colliers Way
Tel: 01952 291 372 *(near PC World)*

WEST AND SOUTH WEST
Bristol
Unit 2 Block C Lysander Road,
Patchway, Cribbs Causeway
Tel: 0117 950 2076 *(near PC World)*
Bristol (3) - opens November 12th
Swindon
Unit 4 Greenbridge Retail Park, Drakes Way
Tel: 01793 434 112 *(near PC World)*
Worcester
Unit C Elgar Retail Park, Blackpole
Tel: 01905 757 947 *(near Sainsbury's)*

ANGLIA
Ipswich
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Tel: 01473 729 308 *(near Harvey's)*
Kings Lynn
Unit 1A Peerpoint Retail Park
Tel: 01553 661347
Norwich
Unit 1 Blackberry Court, Sweetbriar Road
Tel: 01603 484 752 *(near Allied Carpets)*

SOUTH & SOUTH WEST
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Tel: 01296 436 767 *(near Argos)*
Banbury
2 Lockhead Close, Banbury Retail Park
Tel: 01295 279 585 *(near MFI)*
Basildon
Unit 6B Mayflower Retail Park, Arterial Road
Tel: 01268 282 526 *(near Pizza Hut)*
Bedford - opens November 18th
Unit C, Interchange Retail Park
Tel: 01234 346031
Bracknell
The Peel Centre, Unit 5B Skimpedhill Lane Retail Park
Tel: 01344 486 353 *(near Safeway)*
Cambridge
The Bee Hive Centre, Coldhams Lane
Tel: 01223 360 899 *(near Curry's)*
Chingford - opens November 16th
Unit 1A, Corktree Retail Park, Corktree Way, Hall Ln.
Tel: 0181 524 4526
Chippenham
Unit 3B Hathaway Retail Park, Foundry Lane
Tel: 01249 461 230 *(near the railway station)*
Guildford
Ladymead Retail Park, Europa Park Road
Tel: 01483 562 448 *(near PC World)*
Hedge End
Unit 1, 27 Hedge End Retail Park, Tollbar Way
Tel: 01489 795 975 *(near Safeway)*
Kettering
Unit 5 Kettering Retail Park, Carina Road
Tel: 01536 519 813
(near Carpet Right)
Northampton
Riverside Retail Park
Tel: 01604 415 018 *(near Halfords)*
Northampton (2) - Opens November 2nd
Poole
Manning Heath Retail Park, Unit 3 Yarrow Road
Tel: 01202 743 138 *(near Great Mills)*
Reading - opens November 26th
Unit A2, Forbury Retail Park, Forbury Road
Tel: 0118 959 5175
Slough
300 Bath Road
Tel: 01753 534 636 *(near Comet)*
Southampton
Unit 4 Nursling Industrial Park
Tel: 01703 740 693 *(near B&Q Depot)*
Stevenage
Roaring Meg Retail Park, Monks Wood Way
Tel: 01438 741 435 *(near Toys R Us)*

LONDON (M25) AREA
Brentwood
81/85 High Street, Brentwood
Tel: 01277 263 541*(near Nationwide)* Not open Sunday
Dagenham
Unit 3 Merrielands Retail Park, Ripple Road
Tel: 0181 517 2785 *(near Wimpy)*
Hayes
Unit 4 Lombardy Retail Park, Cold Harbour Lane
Tel: 0181 573 1531 *(near Safeways)*

stores open Sundays
For store details
Freephone 0800 316 2 317

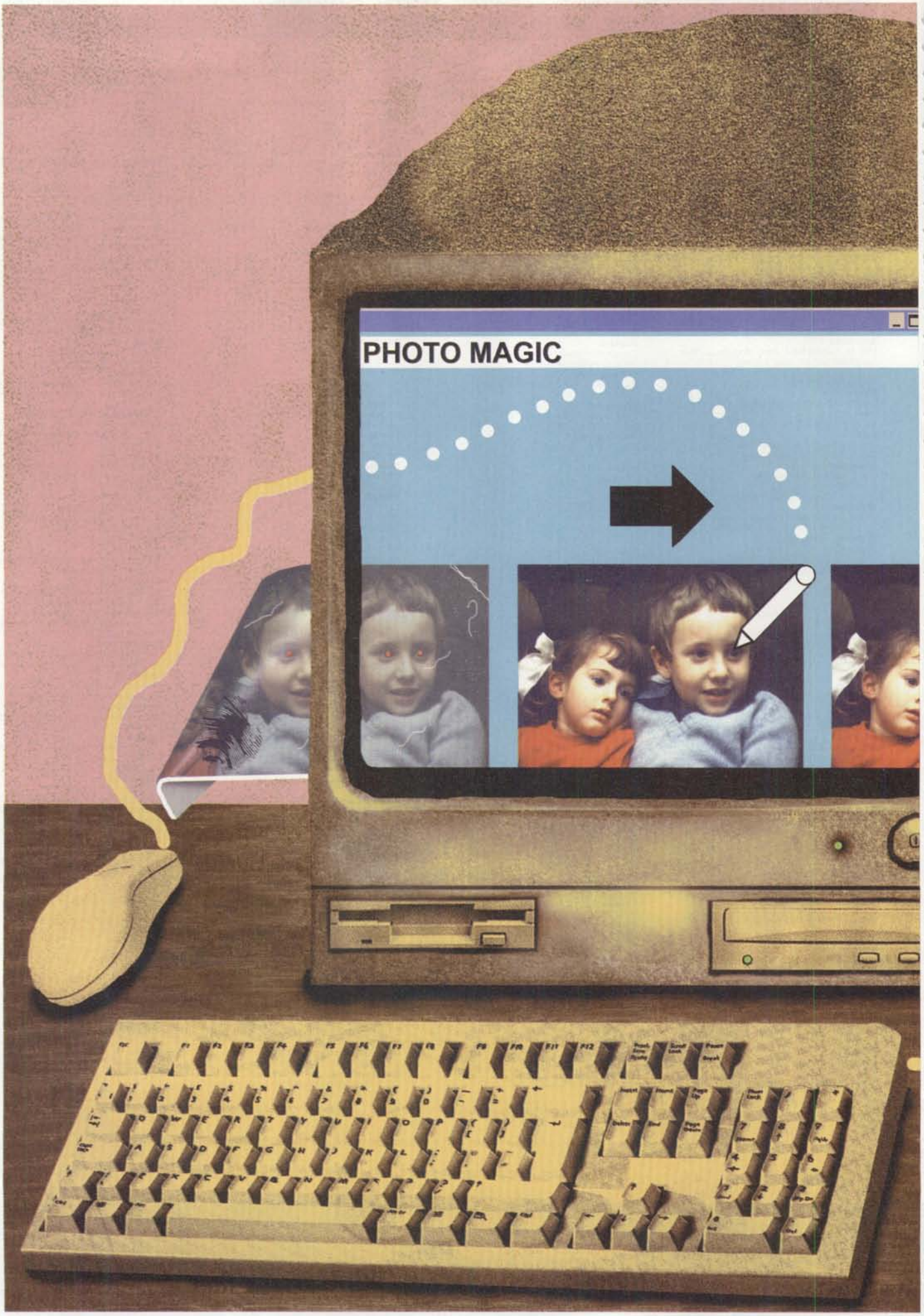
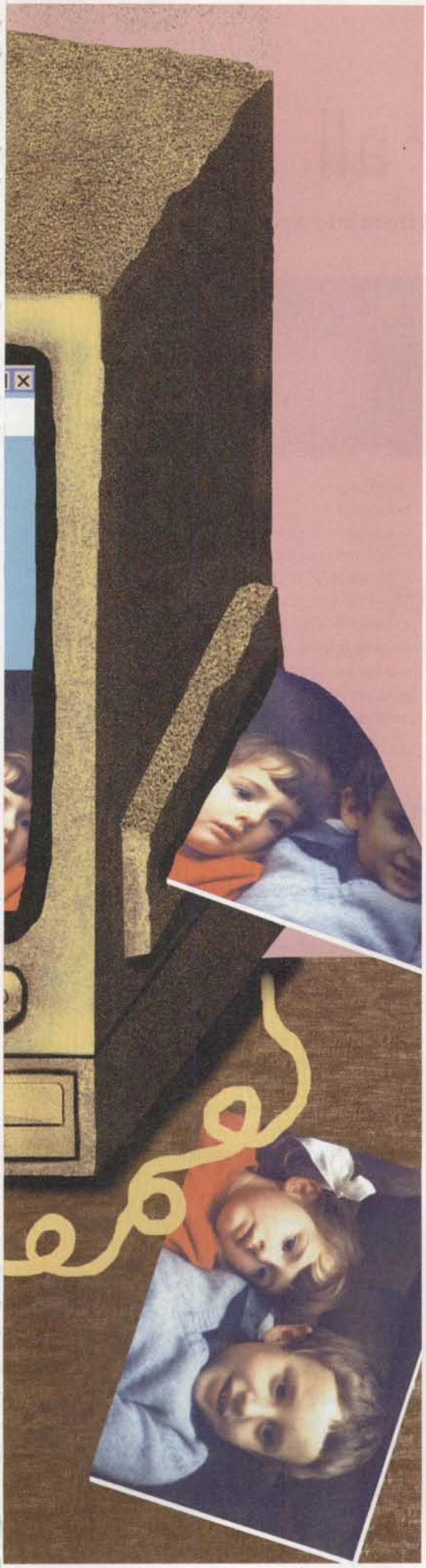


Illustration by Matthew Kenyon



Picture perfect

What you see in your photos need not be what you get: you can change it with image editing software. Ken McMahon checks out ten packages within the reach of most people's pockets.

The days of taking your film to the high-street chemist for processing are numbered – the digital revolution has caught up with your photo album. As with all revolutions, this one has slowly been creeping up on us unnoticed and there are a number of protagonists. Cheaper, better scanners, bigger hard drives, faster CPUs, cheaper RAM and the proliferation of CD as an inexpensive mass-storage medium have all played their part. But the big breakthrough has been with colour inkjet printer technology; only recently has photo-quality reproduction on affordable inkjet printers become a reality. Once, digital photo editing was the preserve of professionals. Now you can view your photos on your PC and make inexpensive hard copies as often as you like.

The software industry has not been slow to recognise an emerging market, and over the past two years consumers have been able to choose from an expanding range of products aimed squarely at the home user. Rather than aiming at the professional or even the enthusiast, these packages are targetted at those whose knowledge of photography is limited to point-and-shoot cameras. The focus is on simplicity and ease of use rather than power features, and they mostly cost less than half a dozen rolls of film, including processing.

It's a fair bet that within a few years, conventional film photography will be all but obsolete and everyone from Kodak to Microsoft will want to be at the front of the queue with the products that are going to replace it. Those companies which succeed will be the ones which make it easiest to get the pictures from your camera to your printer with the best possible reproduction quality. Consumers also want added value: to be able to play with their pictures and incorporate the results in anything from a Christmas card to an email. Here, we look at sub-£100 packages designed to do just that. Next month, we'll concentrate on packages designed for professionals and enthusiasts. These are not cheap, but provide the power and versatility to make virtually anything possible.

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Digital pictures for all

Even if you take simple pictures on a box Brownie, you can still get them into digital format.

Image editing is only for those photographers who can afford digital cameras costing more than £500. Right? Wrong. Even if you are still using a box Brownie, you can easily get your pictures into digital format. If you have overflowing shoeboxes full of prints, you need a scanner (approximate cost, £100. Check out the budget scanners group test in the September 1998 issue of *PCW*, p168). If you want your future photography to be digital, you need not necessarily invest in a digital camera. Kodak's Image Magic service provides a means of getting your photos into digital format without the expense of a digital camera — and you can still have your glossy prints. Kodak provides two options. Either you can have all of your images recorded onto a CD-ROM in FlashPix format, or they can be saved as JPEG images on floppy disk. You can have up to 300 images stored on one CD at a cost of £18.99 for a film of 36 shots, plus £4.99 for the CD. It is a multi-session version, so you can take it back later and have another film added if you want, or you could even turn up with your shoebox-full of pictures and have some old images added to a CD-ROM. For the JPEG images on floppy disk you will have to pay £12.49 for a film of 36 shots, over and above your normal processing costs. Another advantage of the FlashPix format is that if you are using a FlashPix-based editor such as LivePix [*p194*] or PictureIt! [*p199*] some editing functions are supposedly faster, although this claim was not borne out by our experience with LivePix. The maximum resolution of FlashpPix images supplied by Kodak is 1536x1024 pixels. The JPEG images supplied on floppy are a mere 600x400 pixels, which is fine for viewing print-sized on a monitor and you will get reasonably good quality prints on your printer, but you can forget about enlarging them.

▲ THIS RICOH CAMERA IS JUST ONE WAY TO GET A DIGITAL IMAGE

Colour management

Vibrant colour pictures can turn out as wishy-washy prints. Here's how to prevent it happening.

You scan-in your favourite shot: there is a turquoise sea, sand the colour of Demerara sugar and a beautiful azure sky. On your monitor, the sea looks good despite the fact that it may look a little more green than before. The sky has gone paler, though, and the sand is almost white. Oh well, not to worry, it will probably look acceptable when it has been printed out. Won't it? Don't count on it.

Colour management software attempts to correct this nightmare and make your scanner, display and printer all talk the same colour-language. Physically this is something of an impossibility, because your monitor creates colour using *transmitted* light from red, green and blue phosphors, whereas your printer makes use of *reflected* light from a combination of yellow, magenta, cyan and black inks. Nonetheless, by careful adjustment of your monitor and by using colour management software, it is possible to get a much better colour match between various input and output devices.

Colour management software attempts to correct this nightmare

The first thing to be certain of is that your monitor is properly adjusted.

- Make sure it has been switched on for at least an hour before making any adjustments.
- Check out your image editing package to discover whether or not it includes a calibration strip or an image which you can use to optimise the brightness and contrast levels. If one is not supplied, you should be able to find one, as well as plenty of advice on calibrating your monitor, at www.csf.org.uk.
- Most displays have an adjustment which allows you to alter the white-point colour temperature. Usually the factory default is set to around 9,000K which is much too blue, so try adjusting it downwards to around 5,500K.

Or, using a test image, make trial-and-error adjustments until you get the best match with your printer.

If you are still dissatisfied with the results, you need colour management software. This works by producing a profile for each device, comparing the device profile with a reference and adjusting the output to compensate for the variation.

Many applications now provide colour management support. If you have CorelDraw 7, take a look at our *Hands On Workshop* [p214] in the September 1998 issue for an explanation and advice on how to use it.

Agfa's web site at www.agfahome.com contains information about colour management generally as well as the company's Fototune and Colortune products. You can get ICC device profiles for printers, monitors and scanners from most manufacturers' web sites. Mac users can find out about Apple's Colorsync system by visiting the Apple web site at www.apple.com.

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Recommended
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PC Direct
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Sept 1998 issue

RECOMMENDED
PC Advisor
RECOMMENDED
Dec 1998 issue

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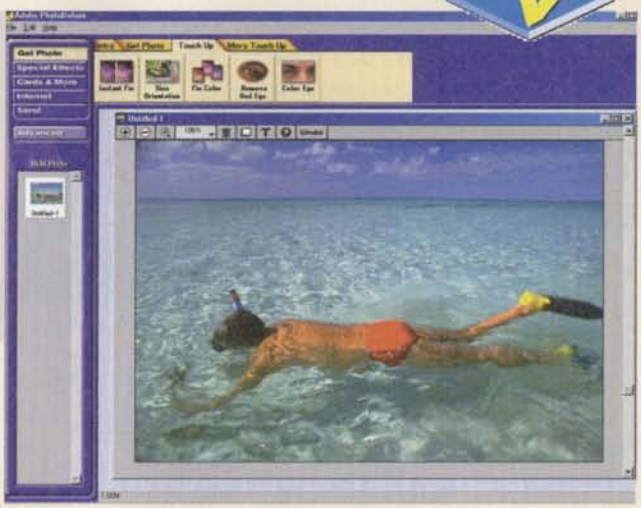
Adobe PhotoDeluxe 2

HIGHLY COMMENDED PERSONAL COMPUTER WORLD

Adobe is a recognised master of interface design and developer of the industry-standard image editing application, Photoshop 5. PhotoDeluxe 2 also combines a top-rate interface with powerful image-processing muscle. Adobe has taken all the common photo-editing tasks and presented them as step-by-step projects which are accessed from a selection of tabbed palettes.



▶BASIC TOUCHING-UP IN PHOTODELUXE 2. THE TABBED PANELS GUIDE YOU STEP-BY-STEP THROUGH THE PROCESS, PROVIDING ONLY THE TOOLS YOU NEED

First stop is the Get Photo palette. Most applications assume you know enough about Windows to accomplish something as simple as opening a file. In PhotoDeluxe 2, even this procedure is guided and various buttons give you the option of opening a file, a library, sample pictures and clipart from the CD, or selecting one of several input devices. Having obtained your picture, the next two tabs provide an armoury of retouching projects including cropping and rotating, red-eye removal and colour balancing. For lazy types, an instant fix button does the necessary while you sit back and watch. If you want to get more involved, you could try your hand at colour balancing.

The size orientation button provides a good example of PhotoDeluxe's guided approach. On pressing the button, a palette with five tabs appears. Each describes the next stage of the operation and provides the tools you need to carry it out. First, an intro tab explains how cropping works and provides a couple of small graphics as illustration. In case you're wondering what to do next, a red arrow with the words Start Here points to the next tab, which is labelled Adjust. This explains rotation and provides two buttons for clockwise and anti-clockwise rotation. Trim Size and Done tabs follow in the same fashion, each with a straightforward explanation of what's going on, and the tools to do the job.

Beyond basic image enhancement and retouching there's a special effects category which holds five palettes: art, fun, collage, cool and cooler. Each of these contains around half-a-dozen projects. The art projects concentrate on turning your photos into something that look more like they were created with a pencil or brush than film and flash. You can choose from sketch, old-fashioned, posterise, impression, hand colour, tint, and glowing edges. Fun has a multitude of distortion and perspective tricks based on special effects filters. Collage projects include switching backgrounds, elementary "transplant surgery" (putting your head on someone else's body), trick scaling ("Honey, I shrunk the kids/dog") and a disguise section which lets you attach clipart moustaches to your least favourite aunties.

The special effects projects work in the same step-by-step fashion. Old-fashioned lets you turn your sharp, colourful, pristine pictures into tatty faded brown things that look like they've been in your grandad's back pocket for the past half-century. It's a three-step project. First, you convert the image to black and white. The tint tab provides a colour picker for you to select your favourite shade of sepia, and then the age panel provides a noise and blur button. It would be nice if there was some way of adjusting the amount of noise as the button applies it by the bucketload. Conversely, the blur button undercooks it, but you can overcome this by pressing it more than once. In fairness, I believe Adobe has got the balance between control and ease of use just right.

If you want to break the bonds of handheld image editing you can always take a deep breath and press the Advanced button. You then have access to tools and commands in a more conventional menu-driven environment. You can disable the one-document-window-at-a-time limitation and display the layers palette. In truth, you are unlikely to need the advanced option other than where you can't get quite the effect you want, or want to use third-party plug-ins.

PHOTODELUXE 3.0

As we went to press, Adobe released PhotoDeluxe 3.0 Home Edition. It features a new-look interface in which round-cornered palettes are a big feature, and access to the many guided projects is via a more direct menu system.

Other new features include digital camera direct access software, basic colour management, Extensis instant-fix filters and a panorama facility for stitching together side-by-side photos. There's also Photoparade, a slideshow which plays themed picture albums. Web content has been extended via the Adobe Connectables web site, although it is not possible to use a guided activity directly over the web, as with the previous version.

The verdict? This new version is not a radical revamp of version 2.0, but more of the same-quality Adobe product we have come to expect.

PCW DETAILS

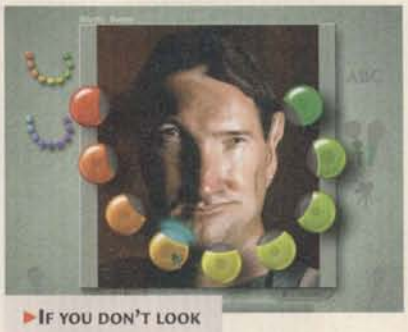
★★★★★

Price *£45.83 (£39 ex VAT)*
Contact *Adobe 0131 458 6842*
www.adobe.co.uk
Good Points *Ease of use. Lots of guided projects.*
Bad Points *None — it does what it says on the box.*
Conclusion *If you're not sure what you're doing, this is the one to go for.*

Kai's SuperGoo

SuperGoo is something out of the ordinary. It lets you stretch, twist, pinch, pull, twirl and otherwise distort your photos. You can elongate chins, make eyes bulge, extend foreheads and turn pictures of ordinary people into grotesque caricatures.

In the Goo room your picture takes centre stage, with two palettes to the left: one contains nine Goo brushes, the other has Goo effects which work on the entire image. With a Goo brush selected you can adjust the size and fluidity. Then, it's really a case of experimental dragging. When you click and drag, the part of the image under the brush is dragged in the direction of the stroke. The most effective brushes are pinch/bulge, twirl, smear, smudge and nudge. There's a very useful Ungoo brush (you just paint over goo'd bits to progressively ungoo the damage) as well as a global ungoo slider. At the bottom of the screen a filmstrip palette provides storage for up to 64 frames which can be played in sequence as a movie (or "Goovie"). The transition from one frame to the next is slick as Goo creates intermediate frames to produce smooth animation. You can export Goovies as AVI or QuickTime files. The Effects palette is a set of eight distortion filters from zig-zag, to squeeze, to spike and wave. There are three settings available from sliders on the right. When you select an effect, all three sliders cycle through their values to give you an idea of the possibilities. Used in conjunction with the filmstrip, it's a great way to produce quick, easy, fluid animations.



▶ IF YOU DON'T LOOK LIKE THIS ALREADY, SUPERGOO HAS ALL YOU NEED TO PRODUCE THAT MELTED LOOK

In the Fusion room you can mix facial features. A library of parts is supplied for you to mix and match, and the dedicated can make their own bits from the family photo album. However, fancy tricks like the gender slider and the mutate button do little to diminish the gimmicky feel of this.

PCW DETAILS

★★

Price *£49.95 (£42.51 ex VAT)*
Contact *Computers Unlimited 0181 358 5858*
www.metacreations.com
Good Points *Highly-flexible distortion. Good animation feature.*
Bad Points *A dog that knows only one trick.*
Conclusion *One for the specialist or as a complement to an existing package.*

Kai's Photo Soap

Photo Soap's interface looks so stunning, it's easy to get carried away as ribbed and rubberised drawers slide smoothly open and shut, panels slide out to reveal 16-slider graphic equaliser-style panels, and tools give off an eerie glow as your pointer hovers over them. Tools look like the real thing. Brushes have visible bristles and long, pointed, wooden handles that might take your eye out if you don't watch it. Erasers are made of chunky, thick rubber, and pencils are yellow with a rubber attached to the end by a thin strip of tin.

Soap uses a room metaphor to give your photo-editing a structured approach. You start in the In room and end in the Out room, passing through the prep, tone, colour, detail and finish rooms in between. You don't have to do it in that order or include every room, as any of them can be entered at any time via a map button at the top of the screen. Right from the start in the prep room you get a chance to make big improvements. As well as cropping and rotating there's an enhance button which samples an area of the image and makes improvements to exposure, tone and colour balance. The other rooms require more judgement on your part. In the colour room you control hue, saturation and lightness via a three-slider control, or you can have a crack at the 12-band colour equaliser. The detail room holds a comprehensive array of retouching tools including red-eye removal, a heal tool for spots, wrinkles, dust and scratches, and smooth, sharpen and clone brushes. In the finish room you can add backgrounds, edge textures and other clipart objects to your pictures.

▶ UNIQUE INTERFACE. BEFORE AND AFTER VIEWS, LEFT AND RIGHT: THE TOOLBOX IS ON THE LEFT; THE 'MEMORY DOTS' ON THE RIGHT STORE THUMBNAIL VIEWS

Soap won't be to everyone's taste. The interface can slow things down considerably and the hardware-challenged will need to turn off some features to avoid gridlock. But the tools and features are first rate.

PCW DETAILS

★★★★

Price *£46.95 (£39.96 ex VAT)*
Contact *Computers Unlimited 0181 358 5858* **www.metacreations.com**
Good Points *Gorgeous interface. First-rate tools. Unconventional.*
Bad Points *Slow. Unconventional.*
Conclusion *As good as anything else, the interface is a love or hate thing. I love it.*

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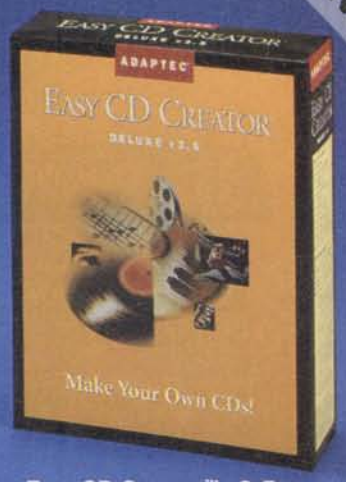

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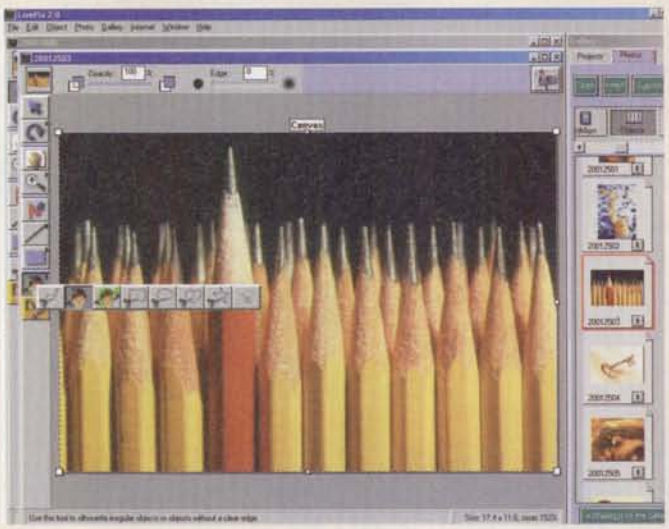
LivePix 2.0

Big pictures make big files in conventional, pixel-based editing. Each pixel needs a byte to represent all the colour information, so an A4 photo at sufficient resolution for good-quality output to an inkjet printer will occupy around 15Mb on your hard drive and up to five times that when pulled into memory by your application (additional space is needed to store previous versions for undo, layer information, alpha channels and so on). LivePix uses an image format called FlashPix which stores the image in several resolutions. This speeds up display and editing because the image is never displayed at a higher resolution than is required. Some editing operations, like resizing and colour adjustments, are stored as scripted "viewing parameters" and are applied to the original image data each time you view or print, rather than as a destructive edit changing the actual image pixels.

▶LIVEPIX DROP SHADOW IS ONE OF THE EASIEST TO USE. THUMBNAIL IMAGES ARE DISPLAYED IN THE GALLERY ON THE RIGHT

▼LIVEPIX OFFERS A GENEROUS RANGE OF CUTOUT TOOLS INCLUDING TWO EDGE-HUGGING VARIANTS FOR JOBS LIKE THESE PENCILS



The LivePix interface is basic. To the left of the main picture window is a tool palette which holds nine tools, some with flyout options. At the top there's a thumbnail which you click to resize or crop, an opacity slider and an edge softener. To the right, the gallery window displays albums of photos and projects. Most of the tools actually do basic things: there is move, rotate, pan/zoom, type, outline, filled shapes, cutout and effects. Text, outline and filled objects are non-destructive.

The problem with pixel-based image editors is that any changes you make permanently alter the image. If you place text or an object over a picture, the pixels underneath are wiped out. Applications like PhotoDeluxe and Paint Shop Pro overcome this drawback by using independent layers; LivePix and others use independent editable objects. The object approach works particularly well with text because you can edit it at any time. Applying special effects like drop shadows is similarly straightforward and the effect is also an editable object, so if you later decide you don't like it, you can change or remove it. It's really only when you get to the bottom end of the toolbox, however, that LivePix does anything beyond the ordinary. There are eight cutout tools — surely more than any other application can boast. Three of these are quite useful. There's a standard freehand cutout tool, an edge highlighter and an edge detector, which is a more accurate version of the highlighter. Besides a cutout edit tool, the remaining four are "cookie cutters" (preset shape cutouts). Leaving the best for last, the fx tool flyout contains a red-eye corrector, distort, colour correction, drop shadow and clone tool.

The gallery is an advanced browser which allows you to organise pictures and projects into albums and drag and drop images between them. There are a number of sample albums provided on the CD and you can create your own. Additionally there is a range of quite well-designed project templates for things like calendars and greetings cards into which you can substitute your own pictures, making extensive use of the many cutout tools provided.

Performance was a little disappointing. I opened a FlashPix-format file in LivePix and Adobe Photoshop 4 and cropped, rotated and zoomed. LivePix opened the document in half the time it took Photoshop, but in all other operations Photoshop was considerably faster. Magnifying the image on-screen, where you would expect LivePix to have a significant edge, was virtually instantaneous in Photoshop but in LivePix it took nearly ten seconds.

FlashPix or not, LivePix is in need of a major injection of excitement if it is to have a hope of competing successfully. Although a big improvement on version 1.0, the general impression is of a dull experience in need of livening up with more sophisticated editing tools and more interesting projects.

PCW DETAILS

★★

Price *£39.95 (£34 ex VAT)*
Contact *LivePix 01429 855048*
www.livepix.com
Good Points *Good collection of projects. Flashpix compatible.*
Bad Points *Slow. Poor feature set.*
Conclusion *A lacklustre performer.*

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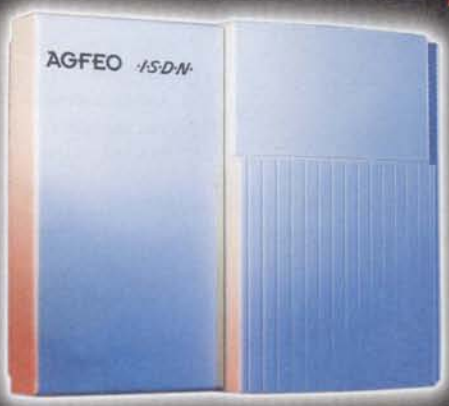

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Metacreations Art Dabbler 2.0

Dabbler is a different kettle of fish to the other packages here, in that it has more in common with paint and canvas than film. In most image editors you work on a page at a time. If you need a new page, you start a new document. Dabbler uses a multi-page approach. The sketchpad is exactly that – a book full of blank pages awaiting your inspired doodling. You can use the sketchpad browser to flip backwards and forwards and to rearrange the page order.

◄YOU NEED TO GET INSIDE DABBLER'S DRAWERS TO DISCOVER WHAT'S AVAILABLE

▼CREATING FLIPBOOK ANIMATIONS WITH THE HELP OF TRACING PAPER

The Dabbler interface looks worryingly bare as initially there are no toolbars or palettes to be seen anywhere: everything is tucked away in drawers just under the menu bar at the top of the screen. The drawers display the most commonly used tools on the front where you can get at them instantly. All the others are neatly tucked away inside. When you grab a drawer handle to open it, you can select from any of the remainder and the newly selected tool replaces one of those on the front. Closing the drawers provides more viewing space for your work, but if you're anything like the artists I know, you'll leave them all open. In this respect, Dabbler's interface is a little dated. Context-sensitive floating palettes would bring it up to date.

The tools drawer contains a good selection of drawing and painting tools, each available in five different sizes. An ink bottle, oil brush, crayon, chalk, pencil, spray can and liquid brush are included. In addition there are tools for rotating and magnifying, an eye-dropper for selecting colour from the image, a hand grabber and a selection of stencils. The stencils work in exactly the same way as real-life ones. Looked at from a software perspective they are, of course, just selection masks available in a variety of shapes. The default selection includes a few geometric shapes but the CD is packed with stencil libraries containing anything from farm animals to fried eggs. Next along is the colour drawer where you can choose from a selection of palettes or use a colour wheel to select a specific hue/saturation/brightness combination. An insignificant-looking little button in the top right-hand corner allows you to clone from the preceding page in the sketchbook. Using the painting and drawing tools as modifiers, you can achieve some interesting effects this way. Another drawer is full of paper textures. Again there's a good choice, and each texture is illustrated by a little swatch. If you can't find what you're looking for, there are additional libraries on the CD.

Dabbler's multi-page capabilities combined with its tracing-paper feature make it an excellent animation tool. The tracing-paper command makes the top drawing layer transparent so you can view the preceding page beneath it. In fact, you can make up to three preceding or subsequent pages visible in addition to the current one. Using Dabbler's flipbook feature you can build up animations frame by frame and play back and edit using a viewer applet. Completed animations can be exported as QuickTime or Video for Windows movies. Flipbook animations are put to good use as a series of tutors. As well as How To Use Dabbler there are two other excellent tutors: Drawing Cartoons, and Cartoon Animation. Additional bits and pieces include a small stock-photography library and three KPT plug-ins – Gradient Designer, Page Curl and Planar Tiling.

It's one thing to scan a photo and apply a few filters. Creating your own illustrations and animations from scratch is in a different creative league. If you feel more at home with a few felt tip pens, poster paint, bits of paper and PVA glue, or fancy yourself as the next Tex Avery, then Dabbler is the way to go.

PCW DETAILS

★★★

Price *£46.95 (£39.96 ex VAT)*
Contact *Computers Unlimited 0181 358 5858*
www.metacreations.com
Good Points *Natural media tools. Multi-page sketchbooks. Animation features.*
Bad Points *Interface looks a little dated.*
Conclusion *Great fun. A must for budding cartoon animators.*

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MGI PhotoSuite II

MGI has responded to the changing market by restarting from scratch. PhotoSuite II bears no resemblance to its predecessor (version 8.05). Tools and menus have been replaced by a graphical interface organised around six modes and selected via a button panel. Areas of activity are: Photos, Projects, Albums, Slide Shows and Guides.

A selection of these activities, based on the current mode, appears beneath the mode panel. In photo mode you can edit, rotate, crop, touch-up and transform or save, print and send. As well as the standard toolbar, you are provided with tools to do the job. A control panel at the foot of the window displays fine tuning adjustments for the selected tool. It may sound complicated but is simple in practice: select a mode, then an activity, then a tool.

The edit photo activity is equipped with a good set of easy-to-use tools including a cloner, filled and unfilled shapes, an eye-dropper colour selector and an undo eraser. Touch up and transform has four options: remove red-eye, touch-up, special effects and warp. Touch-up provides a pull-down menu of image enhancement options including one-touch enhance, colour balancing, scratch removal and soften and sharpen filters. Warp provides Goo-style image distortions. But the special effects option has a disappointingly thin selection of filters.

The remaining five modes leave plenty to do. Albums provides a way of organising your digital picture collection. Projects lets you create cards, collages and so on. The quality of the template collection is nothing to shout about but you can at least edit object layers (not possible in photo mode). The internet mode provides seamless web access to browse online picture resources.

◄PHOTOSUITE II OFFERS A RANGE OF GUIDED ACTIVITIES WITH THE RIGHT TOOLS TO HAND WHEN YOU NEED THEM

PCW DETAILS

★★★★

Price *£49 (£41.70 ex VAT)*
Contact *MGI software 01628 680227*
www.mgisoft.com
Good Points *Well structured. Lots of features in an accessible format.*
Bad Points *Poor-quality templates. Few filters.*
Conclusion *Comprehensive. Nicely presented package.*

Microsoft PictureIt! 2

The PictureIt! interface has a familiar look. A central picture window is flanked on the left by a workbench and projects tabs. There's an object stack to the right and a filmstrip at the bottom for storing and retrieving open picture files.

The interface divides editing tasks into two groups. The workbench tab provides a set of tools for photo retouching and you can add text to pictures, make cut-outs, crop, size and position images, remove red-eye and scratches, apply special effects, save and print. Click on the adjacent projects tab and you can choose from a selection of guided activities such as collages, invitations, frames and others. Workbench tools are straightforward to operate and step-by-step guidance is provided. Most operations are completed in just a couple of steps.

Performance was rather slow. PictureIt! needs to redraw the screen almost every time: when you click to select the crop tool or a new shape, and when you click to enter precise dimensions, and when you click to cancel. Each redraw takes about five seconds and it all gets rather tedious. The slow speed may have been partly due to the multi-layered nature of the test document which was one of the excellent project templates supplied.

One of the good things about PictureIt! is the way that it handles object layers. These are available in workbench and project views and are displayed in the object stack. You just drag objects to a new position in the stack to reorder them, or right-click to get a menu from which you can delete, promote and relegate layer objects, or view a movie tutorial.

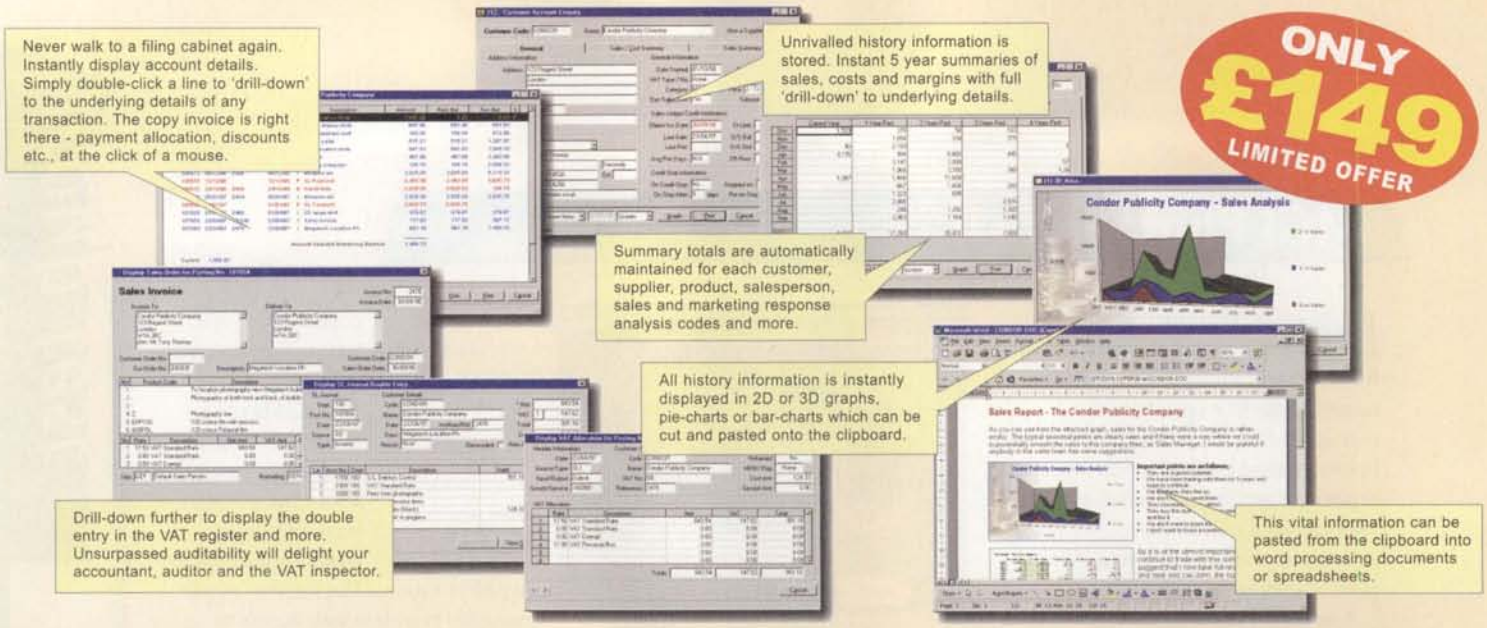
Although it's looking a little dated and will shortly be replaced by PictureIt 99, PictureIt 2.0 is still a pleasure to use. The help facilities are bettered only by Adobe's PhotoDeluxe 2.0 (*see p191*). But PictureIt! is slow, and more recent releases of image editing software have the edge in terms of features.

◄PICTUREIT! HAS EXCELLENT PROJECT TEMPLATES AND CLEAR GUIDANCE

PCW DETAILS

★★★

Price *£49.99 (£42.54 ex VAT)*
Contact *Microsoft 0800 002000*
www.microsoft.com/pictureit
Good Points *Clear uncluttered interface. Good guidance and collection of project templates.*
Bad Points *Slow. A little dated.*
Conclusion *Nice, but just past its sell-by date.*



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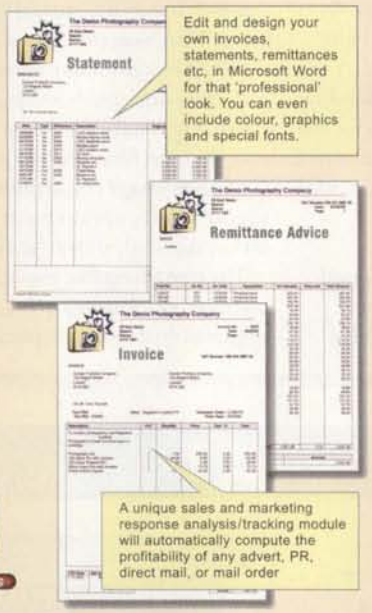

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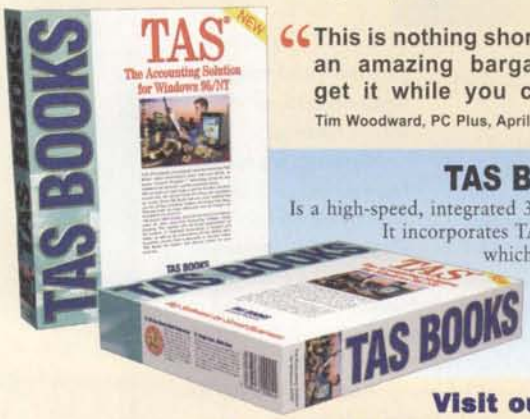

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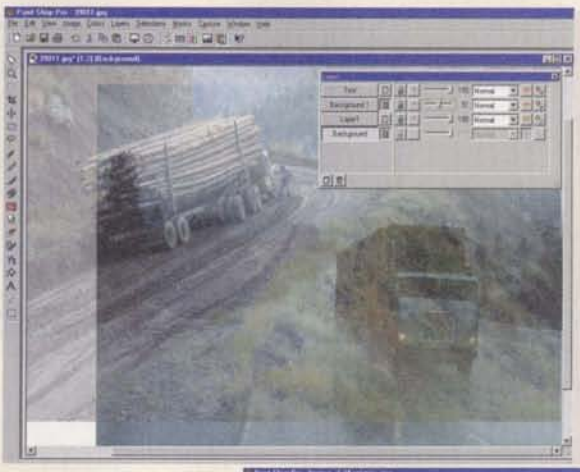
Paint Shop Pro 5

One of the many things Paint Shop Pro has going for it is that it is shareware. You can download it from the web or get it from our *PCW* cover-mounted disc and play with it for 30 days before shelling out. If you decide it's not worth it, you can send it to the recycle bin but, given what this modestly-priced program can do, it's unlikely.

Paint Shop Pro has evolved from a one-trick file conversion utility to one of the most able image editing packages around. Most of its new features have been introduced with version 5, so if you're still plugging away with version 4.14, an upgrade is in order. New features include support for Adobe-compatible third-party plug-in filters, layers, alpha channels, Bezier-curve drawing, picture tubes, multiple undo and CMYK separations. If all that means little to you, don't fret. While it doesn't provide the kind of guidance you get with PhotoDeluxe 2, with a little knowledge of how digital images work you can get Paint Shop Pro to do almost anything the "professional" packages can manage.

The editing window is uncluttered, so even on a 14in monitor you get a clear view of what you're doing. There's a toolbar with the standard file and edit buttons, as well as some toggle buttons for things like full-screen preview, control, colour, layer and histogram palettes. The bulk of the remaining tools live on the left of the main image window. A status bar shows short descriptions of each tool as you point to it and, if you hover, a hint panel appears with a one- or two-word description.

Layers have become the must-have feature for image editors and Paint Shop Pro's implementation is comprehensive and versatile. The layers palette displays the layer name together with toggle buttons for visibility, grouping, transparency protect and layer mask functions, and an opacity slider. With transparency protect selected you can only edit non-transparent areas of a layer. You can assign layers to different groups simply by clicking on the toggle button which then displays the number of the group to which it belongs. There's also a pull-down list of blend options. These define how pixels in the layer will interact with those below it.



◀PAINT SHOP PRO'S LAYER CONTROLS MAKE THIS KIND OF THING EASY, IF A LITTLE SLOW

▼A GOOD BROWSER GOES A LONG WAY TO HELPING FIND THE RIGHT IMAGE

The retouch tool is a versatile brush which lets you selectively apply special effects. Used in combination with the control panel, you can select from a variety of retouch modes including dodge and burn, emboss, smudge, push and a variety of colour modifications. You can also select from dozens of paper textures which give the effect of painting onto marble, canvas, fruit peel, nail clippings or whatever.

Version 5 now provides web animation facilities in the form of Animation Shop. This separate application creates animated gifs using a filmstrip approach and dropping in images one frame at a time. An animation wizard takes you through the process of adding the frames and setting the frame rate, then you can play the sequence and make edits. There's an excellent optimisation wizard which ensures that your file is small enough and fast enough to play over a slow-speed internet connection. In combination with Paint Shop Pro 5's layer capabilities, Animation Shop provides as good an environment as any (with the exception of specialised tools like Debabelizer) in which to create GIF animations for the web.

If you see yourself using Photoshop, but can't afford it or perhaps you are not quite ready for it, Paint Shop Pro is the next best thing. It provides the same kind of power and versatility and it's disappointments are few. The undo history, for example displays all your recent actions but will only undo them in reverse order, so you cannot be selective. Furthermore, if you make several brush strokes with one tool, undo undoes them all — not just the last one. This is criminal. The whole point of an undo is that it lets you correct a slip without having to go back to the beginning.

PCW DETAILS

★★★

Price *£69.95 (£59.53 ex VAT)*
Shareware. Full working version on 30-day trial.

Contact *Digital Workshop 01295 258335,* www.jasc.com

Good Points *Great layer control. Excellent retouch tool. Nice image browser. Animation shop.*

Bad Points *Slow under pressure. Poor undo.*

Conclusion *Power without the price tag to match.*

Professor Franklin's Instant Photo Effects

Instant Photo Effects is a relative newcomer to the digital photo-editing scene. It's aimed at home users who are substituting a roll of film and a trip to the chemist for a digital camera and colour inkjet printer.

Its interface is cute and not intimidating. Beneath the picture window there are six film canisters labelled Photography, Artistic, Edges, Frames, Darkroom and Accents. Click on any of them and it unravels a menu that looks like a length of film, based around half-a-dozen options. Selecting one of these presents a further level of choices. So, if you start with the artistic canister, the film unravels to reveal impressionism, painting, drawing, lithographic, etching and embossing. Selecting one provides a further half-dozen effects.

Drawing effects include charcoal, pen and ink, pencil, colour and black and white chalk, and marker. Accents includes lighting effects, texture filters and drop shadows. Many of these are like mini macros: one-touch buttons which build up complex effects by automatically applying a number of processes. The Antique option from the photography canister, for example, removes colour, adds a sepia tone, fades and scratches the image, produces a torn-edge effect and adds antique-style photo corners.

The greetings card templates are high calibre and there is a nice collection of frames, with styles ranging from traditional to modern, to just bizarre.

◄A GREAT SELECTION OF FRAMES AS WELL AS EFFECTS IN DEPTH, ALL WRAPPED UP IN A FUN INTERFACE

Some of the touch-up tools leave much to be desired, though. Red-eye removal and the dust and scratches filters in particular are rather poor. That aside, Professor Franklin's is an enjoyable image-editing experience. It lacks the guidance and flexibility of PhotoDeluxe 2 but makes up for it with an in-depth selection of good effects.

PCW DETAILS

★★★

Price *£29.95 (£25.89 ex VAT)*
Contact *Guildsoft 01752 895100*
www.swsoftware.com
Good Points *Good range of effects. Few duds. Lots of fun.*
Bad Points *Little to offer besides prepackaged effects and processes.*
Conclusion *Fun, but you could quickly outgrow it.*

Ulead Photo Express 2

EDITOR'S CHOICE PERSONAL COMPUTER WORLD

Photo Express 2 sports a brand-new interface built around a central workspace which holds your image. There is a command panel with five buttons: get, edit, print, share and express. A context-sensitive toolbar provides appropriate tools, depending on which of the command panel buttons you press. The toolbar provides six sources from which to pull-in pictures: from a digital camera to a plain-old file on your hard drive.

If your own collection of digital snaps is a bit sparse, there are albums of Ulead ones for you to play with. Clicking on a category displays the first four images. Then a slide show starts. The show can be controlled using VCR-style buttons, which looks impressive but is not a practical way of choosing pictures. When you have found the picture you want, you can go to edit mode. The global viewer then comes into play: whenever you open a file a thumbnail view is added, making it a quick and easy way to switch between images.

▲EDITABLE TEXT EFFECTS ARE SIMPLE. A PREVIEW, AND CONTROLS FOR COLOUR, POSITION, TRANSPARENCY AND SOFT EDGE ARE ON THE RIGHT

A wide selection of editing tools is supplied: rotate, trim and size, sharpness, lighting, colour balance and retouching are shown on the top toolbar when the Adjust sub-mode is selected. Options for each are available on the options panel so when you click, say, colour balance the panel displays eight preset thumbnails showing colour variations.

The toolbar-options panel combination works a treat. To apply text, press the text button, select add/edit from the toolbar and key the text into the window in the options panel choosing font, colour and other attributes (but oddly, not size). Then you can click any of the modifier tools, such as shape effects, 3D or shadow and go to work using the options displayed — usually a two-tab affair offering presets or variable control.

PCW DETAILS

★★★★

Price *34.95 (£29.74 ex VAT)*
Contact *BIT 01420 83811*
www.ulead.com
Good Points *Great interface. Fast, in-depth tools.*
Bad Points *Cheesy project art.*
Conclusion *Straightforward, no-nonsense image editing that works.*

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Table of features

Product	PhotoDeluxe 2	Kai's Super Goo	Kai's Photo Soap	LivePix 2	Art Dabbler 2
Manufacturer	Adobe	Metacreations	Metacreations	LivePix Inc	Metacreations
Contact	Adobe	Computers Unlimited	Computers Unlimited	LivePix Inc	Computers Unlimited
Tel	0181 606 4001	0181 358 5858	0181 358 5858	01429 855048	0181 358 5858
Web URL	www.adobe.co.uk	www.metacreations.com	www.metacreations.com	www.livepix.com	www.metacreations.com
Price ex VAT	£39.00	£42.51	£39.96	£34.00	£34.00
Price incl. VAT	£45.83	£49.95	£46.95	£39.95	£39.95
Layers/objects	3	2	✗	3	✗
Special effects	4	4	4	2	3
Colour correction	3	✗	4	2	✗
Web support	3	2	✗	3	✗
Animation	✓	3	✗	✗	✓
Cloning	3	2	3	3	3
PS Tablet support	✗	✗	✗	✗	Y
Multiple/Selective undo	✗	✗	✗	✗	✗
Flashpix support	✓	✓	✓	✓	✗
Projects	✓	✗	✓	✗	✗
Text	1	2	1	2	2
Album	✓	✗	✗	✓	✗
Selection tools	3	1	1	2	2

Table of features

Product	PhotoSuite II	Picture It! 2	Paint Shop Pro 5	Professor Franklin's Instant Photo Effects	Photo Express 2
Manufacturer	MGI software	Microsoft	JASC	Streetwise software	Ulead
contact No	MGI software	Microsoft	Digital Workshop	Guildsoft	BIT
Tel	01628 680227	0800 002000	01295 258335	01752 201706/8	01420 83811
Web	www.mgisoft.com	www.microsoft.com	www.jasc.com	www.guildsoft.co.uk	www.ulead.com
Price ex VAT	£41.70	£42.54	£59.93	£25.89	£29.74
Price inc vat	£49.00	£49.99	£69.95	£29.95	£34.95
Layers/objects	2	2	4	N	3
Special effects	1	2	3	3	3
Colour correction	1	1	2	3	4
Web support	2	✗	3	3	3
Animation	✗	✗	✓	✗	✓
Cloning	✗	✗	3	✗	3
PS Tablet support	✗	✗	✗	✗	✗
Multiple/ Selective undo	M	✗	S	M	✗
Flashpix support	✓	✓	✓	✓	✓
Projects	✓	✓	✗	✓	✓
Text	2	2	2	2	3
Album	✓		✗	✗	✓
Selection Tools	3	1	3	✓	4

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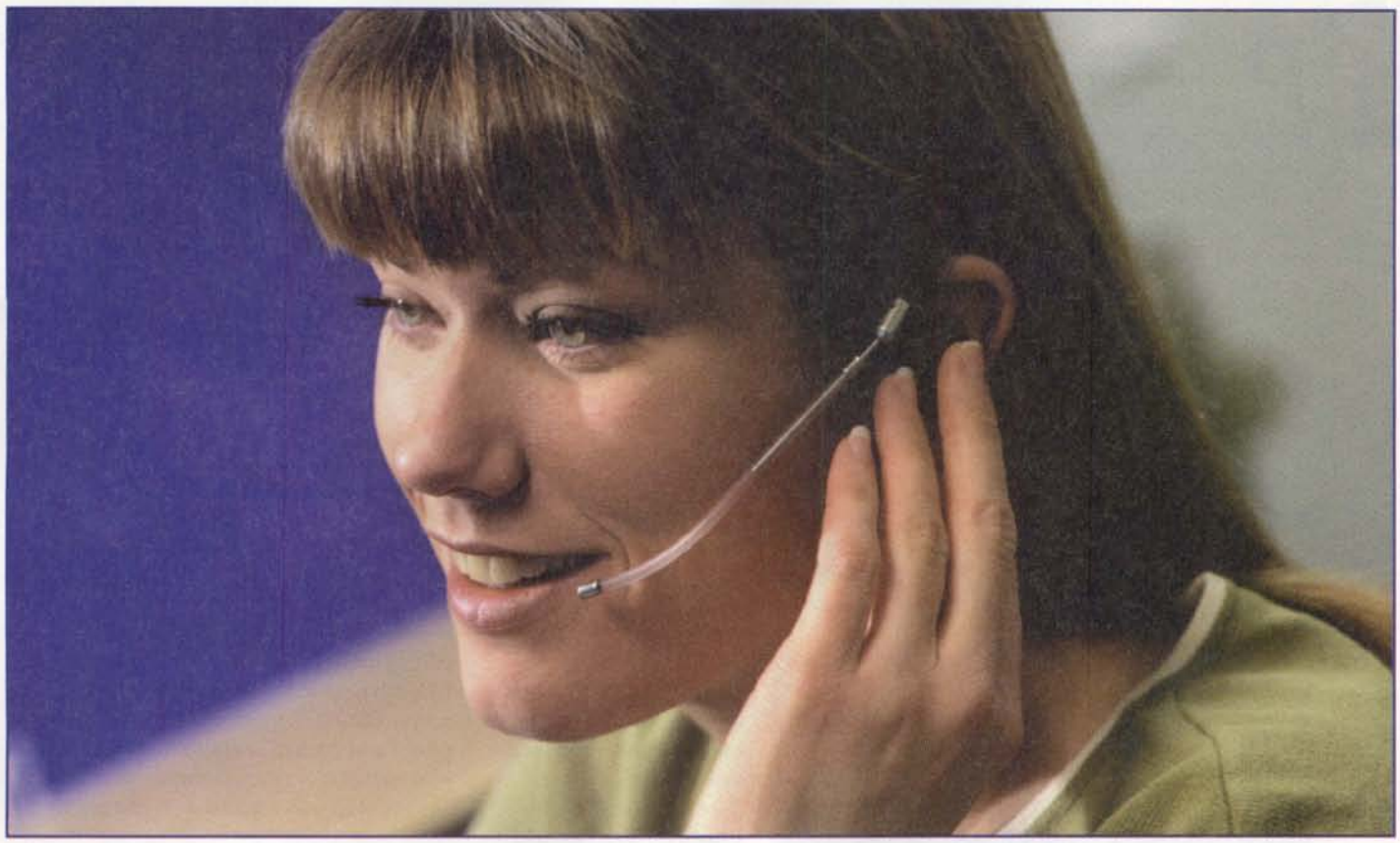

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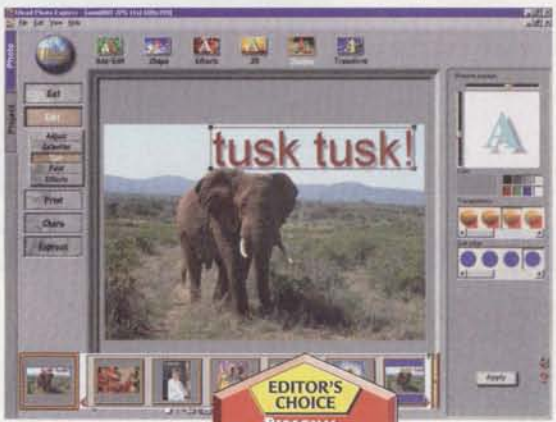
Editor's Choice

Home photo-editing is easy. Here is our summary of snappy photo-editing software to suit you.

Photo editing is becoming the consumer killer app for the late nineties. There are few, if any, home applications where the PC has so comprehensively taken on an existing technology (film) and made it quicker, simpler, and cheaper than it was previously. This is a relatively new development, though, and the software industry is only just catching up with products that are truly consumer orientated.

Until recently, image editing packages looked and worked like any other windows package; all lengthy menus and impenetrable dialogue boxes. You needed to be both an expert in digital imaging and well acquainted with the software to attempt even the most straightforward operations. In this market, developers competed on features, adding more effects and tools with every new version. But as home photo editing becomes a reality, it is interface design rather than features that separates the top packages from the merely adequate. Those which succeed have focused from the outset on what consumers want, rather than on what the technology can provide.



▲ ULEAD PHOTO EXPRESS 2

EDITOR'S CHOICE PERSONAL COMPUTER WORLD

The first to try this approach was Adobe. With PhotoDeluxe 1, the company successfully provided many of Photoshop's sophisticated tools and features in an intuitive, easy-to-use format. When Adobe released PhotoDeluxe 2, rather than add a raft of new features, it further improved the interface by, for instance, reducing the number of steps required to complete projects. Where Adobe has led, others have followed,and a loose-knit standard seems to be emerging.

Ulead's PhotoExpress, MGI PhotoSuite II, and Microsoft PictureIt! all opt for a dual photo-editing/project approach. First, you retouch and edit your pictures, then incorporate them in a publishing project. Another thing these applications have in common is that they provide space on-screen for project and photo libraries, or albums. And one thing all are attempting, some with more success than others, is to limit what's displayed on-screen, be it editing tools or other information, to only what you need for the task in hand.

PhotoDeluxe has held top spot among the consumer titles for a long time. Although much of the competition has caught up, few have surpassed it, so it is **Highly Commended**. It has an excellent range of guided projects combined with powerful tools. Its tabbed, panel-guided, project approach remains one of the most accessible methods for achieving results quickly and easily.

Paint Shop Pro 5 is also **Highly Commended**. This may seem a strange choice because, in terms of interface design, it has none of the new consumer features mentioned above and belongs to what you might call the unreconstructed school of image editing. It does, however, offer a remarkable range of features and the kind of flexibility and power you'll find only in professional packages. It's shareware, too, and it includes one of the best little animation applications around in the form of Animation Shop.

▲ ADOBE PHOTODELUXE 2

HIGHLY COMMENDED PERSONAL COMPUTER WORLD

Ulead Photo Express is our **Editor's Choice**. It includes everything that's best about the other packages. In photo mode you have the option of pre-set editing modes or custom adjustments for each function. So, in addition to the simple fast-track route, there's more power and control available for those who want it. And the custom options are almost as easy to use as the pre-set ones.

▲ PAINT SHOP PRO 5

HIGHLY COMMENDED PERSONAL COMPUTER WORLD

Its interface is clearly structured and every aspect has been considered. The command panel, toolbar and options panel work together to provide the resources you need at the appropriate level for the task in hand. Ulead has succeeded superbly in removing the frustration factor involved in getting to grips with digital pictures: PhotoExpress II is a pleasure to use.

• *See our group test next month of professional-level photo-editing packages.*

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Straight to video

Videoconferencing, digital camcorders: digital video promises much, but you need to know just what it can deliver, and when. We round up the facts and press play.

You've heard the hype and seen the ads, but there is much, much more to the digital-video revolution than Sky Digital and BBC Choice. Digital camcorders, DVD, video capture and video conferencing are all opening up a world of possibilities undreamt of a few years ago. The advantage of digital video over analogue is immediately apparent to anyone who has tried to work with either. Digital offers crisper, cleaner images, and, of course, for the PC user it is much more exciting. Video recording and editing has been opened up to anyone with a reasonably up-to-date PC and is no longer the preserve of the professional. For anyone who has tried to edit home movies using their VCR, the latest digital camcorders and video capture cards come as a welcome relief. In this group test we line up and review the products that would be a boon to any amateur film maker. You will doubtless have been tempted by a DVD drive. Before you hand over your credit card, do your bank balance a favour: read our expert guide to all the issues involved, and check out our tests on the best drives available. And whether it's for business or just to stay in touch with friends and family over Christmas, video-conferencing is the solution. We look at systems aimed at power users and at the home market – there is even one which does not need a PC.

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Contributors: Adele Dyer, Gordon Laing, Paul Trueman, Nik Rawlinson and Andy Shaw

Illustration by Daniel Mackie

DVD

DVD is the future of software delivery and a neat way to watch your favourite movie. Here's how...

Wherever you go, someone's talking about playing DVD movies on your PC. Well, the marketing people are anyway. But what if you want to watch the movies on your TV? Can you get around regional coding and confidently import US titles? What sort of hardware and software will you need? As usual, many questions; as you'd expect, we have all the answers.

First a quick word on the DVD format itself. DVD discs look just like CDs, but thanks to finer tracks and pits, they can squeeze on at least seven times as much information. DVD's standard capacity may be an ample 4.7Gb, but this can be immediately doubled to 9.4Gb by using both sides of the disc. Yet more cunning is the ability for the laser to refocus onto a second layer of information, increasing the capacity of a single-sided disc to 8.5Gb, or a double-sided disc to a whopping 17Gb. The possibilities offered by this sort of capacity have resulted in DVD being nicknamed the Digital Versatile Disc.

The best known application for DVD is for watching movies at home. Even using a single-sided, single-layer disc, it's possible to store a full two-hour movie at a quality much higher than VHS or, better still, Laserdisc. With all that space on a disc, it's also possible to store an album of uncompressed music at 24-bit/96kHz, which hi-fi enthusiasts claim sounds much better than conventional 16-bit/44.1kHz CDs. With between seven and 24 times the capacity of a CD-ROM, imagine the possibilities for encyclopaedias and games: even the CorelDraw suite could once again be sold on a single disc!

So what do you need to play DVD discs? In the home, most people will opt for a domestic player, which looks just like a CD player and costs around £500. This will play movie DVDs on your TV, audio CDs through your hi-fi, and most can support the forthcoming super-fidelity audio discs.

On your PC, you'll need a DVD-ROM drive. These look just like conventional CD-ROM drives, can read both DVD and CD discs, and cost around £100. Like CD-ROM drives they also come in ATAPI and SCSI versions, although the latter are much less common.

Already, some DVD-ROM drives are being described as double-speed or even faster still. Like CD-ROM drives before them, the faster you spin the disc, the quicker you can get the information off it. This is of particular benefit when running computer applications off a DVD disc or installing software, although some manufacturers have recently claimed that for smooth DVD movie playback on your PC, you should be using at least a double-speed DVD-ROM drive.

Most recent drives are capable of this or faster — Pioneer's latest model boasts six-speed for DVD and 32-speed for CD. It's certainly worth considering a brand-new model of DVD-ROM drive, since these are also more compatible with the variety of rewritable DVD formats available now or under development.

Video

DVD movies compress their video using the MPEG-2 system and hence require some kind of MPEG-2 decompression or decoding before they can be viewed. This decoding is traditionally done by hardware fitted in DVD players or on an optional PC expansion card bundled with most DVD-ROM upgrade kits. Don't, however, assume that all PCs fitted with DVD-ROM drives will come with hardware decoders as standard. Normally, your existing graphics card is connected to the decoder card which is then connected to your monitor, so that both the standard Windows desktop, along with the decoded video, can be viewed on the same screen. Most decoder cards employ external analogue VGA pass-through cables to your graphics card, but whatever the manufacturers tell you, there is a very slight drop in image quality of your standard Windows desktop when passed through another card.

◄VIDEOLOGIC'S DVD PLAYER OFFERS HARDWARE DECODING OF MOVIES: NOTE THE VGA PASS-THROUGH PLUG

Most MPEG decoder cards also feature standard composite and sometimes superior S-Video plugs to connect directly to a TV set. You won't see the Windows desktop, but you will see full-screen decoded video. If you only ever want to play DVD movies on your TV, then you could reason that the VGA pass-through cable is unnecessary and leave your monitor directly connected to your graphics card. While this works with Creative Labs' DVD Encore bundle, VideoLogic claims it won't with its recent DVD Player, which relies on your graphics card for sync signals [*see "Reviews", p99*].

Audio

The vast majority of DVD movies feature a Dolby Digital soundtrack. While Dolby Digital (also known as AC-3, after its compression algorithm) can supply plain-old stereo, it is most exciting when delivering digital surround sound. It does so using six separate channels: three for the front, two on the rear, and one for a dedicated sub-woofer. Since this is in effect five full-range channels and one narrow-range for sub-bass only, it is known as a 5.1 system. Decoder cards can take this 5.1

DIGITAL dts SOUND

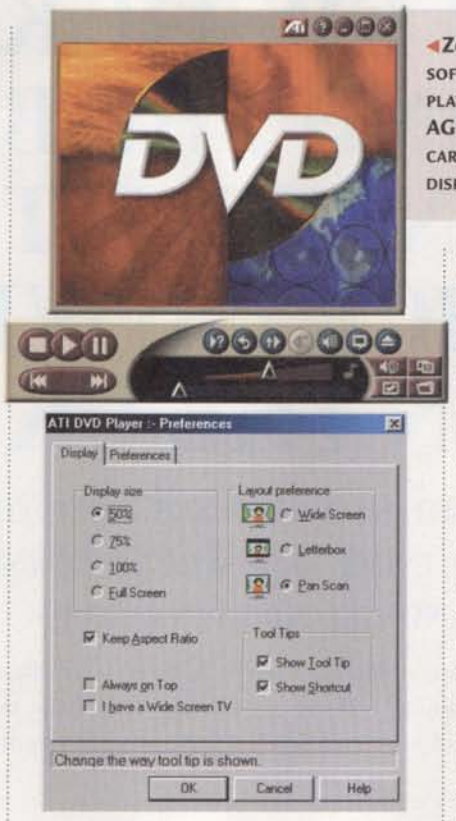
▲DTS BOASTS BETTER SOUND QUALITY THAN DOLBY DIGITAL, BUT THE FIRST DTS DVD TITLES HAVE BEEN DELAYED UNTIL EARLY 1999

soundtrack and down-mix it into two-channel analogue stereo which can be passed through your sound card, on its way to your PC speakers or hi-fi.
Most decoder cards can also supply the raw Dolby Digital information through a phono socket to an external home cinema processor to access the full 5.1 channels, although you will of course need the required speakers and amplification to hear it.

Dolby Digital isn't the only 5.1 surround format. The same people who developed MPEG-2 for video encoding have a 5.1 audio system which was originally going to be standard on all European movies until Dolby got its foot in the door. There's also DTS from Digital Theatre Systems, which uses less compression to provide superior sound quality but therefore also requires around four times the space as Dolby Digital. Both MPEG 5.1 and DTS are optional extras for DVD movies and, like Dolby Digital, you'll need an external processor to decode their full 5.1 channels. There are a handful of European titles from Polygram with MPEG 5.1 audio, but sadly the initial US roll-out of DTS DVDs continues to be delayed.

Software

All PC decoder cards come with software utilities for playing the movies, which allow you to navigate the disc and its options such as choosing the desired subtitles or soundtrack. However, given a powerful enough processor, it is in fact possible to decode the video and audio through software alone. Zoran was first on the scene with its SoftDVD player which could perform full-screen full-motion decoding using a fast Pentium II processor — anything over 350MHz should do. More recently, some graphics cards have featured motion compensation in hardware to help the software decoding along. ATi was the first to implement this with its Rage Pro AGP products in conjunction with Zoran, and claims a 20 to 30% performance increase over using just software decoding alone. Software decoding is great for viewing movies on your PC monitor, but what if you want to connect your TV? Without the suitable plugs you'd have found on a hardware decoder card, you're stuck. Your graphics card may feature composite or S-Video outputs you could use, and you'll be able to hear down-mixed stereo from your sound card, but the chances of having a socket through which the 5.1 audio can be routed, is fairly unlikely.



◄ZORAN'S SOFTWARE DVD PLAYER FOT ATI AGP GRAPHICS CARDS: NOTE THE DISPLAY OPTIONS

Regional coding

To prevent pesky importers messing up Hollywood's global distribution schedule, almost every DVD movie has regional coding. The world is divided up into six regions (North America is Region 1, while we're in Region 2 with the rest of Europe and also Japan). Domestic DVD players are forced to play titles from their native region only, unless sneakily modified by a third party. When playing DVD movies on your PC, the regional coding is checked out by your software player, which normally asks you what region you're in during installation. Most players allow you to change the region up to five times, which means you could install your desired regions on separate Windows hardware profiles and effectively choose your region when starting your PC.

►CAN'T FIND ANY DVD TITLES IN YOUR LOCAL STORE? THEN HOW ABOUT BUYING REGION 1 US MOVIES OVER THE WEB

Picture quality

Anyone who's watched video playback on a PC monitor knows it looks quite different to the TV, due to different types of resolutions, phosphors and shadow masks. It tends to look sharper and with more contrast — not necessarily wrong, but different, unfamiliar, and usually, as a consequence, less preferable. Most decoders also offer some kind of interpolation to scale the picture to fill your screen regardless of your resolution. This too can look strange, with many people preferring to set up a hardware profile running at 640x480 pixels just for playing movies. The good news is that when plugged in to your TV, the picture can be pretty much as good as a domestic DVD player. Where possible, always use the S-Video connection, then sit back and enjoy a picture far superior to VHS.

Conclusion

While undeniably neat, you have to ask yourself why you'd want to play DVD movies on your PC. Starting up your computer is not quite as convenient as switching on a domestic player, and they do tend to whirr annoyingly in the background. For the best picture and sound you'll want to connect your DVD player to your TV and hi-fi, but how many people have their PC in the same room? And once you've settled down to watch the film, what happens when the phone rings? Very few PCs come with remote controls. So saying, DVD is the future of software delivery and will become as ubiquitous as the CD-ROM drive is today. When buying a new PC, it's worth specifying a DVD-ROM drive; and those living with CD-ROM drives today should consider upgrading in the near future.

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3 Speed of access provider	=	=	=	=	✗	=	=	=	=	=	✓	=	=
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Sony **DDU220E**

Sony has entered the DVD fray with a third-generation 5X drive that can also read CD, CD-R and CD-RW. The DDU22OE is the first DVD to employ CAV (constant angular velocity) technology, first used in 32X CD-ROMs, which reduces the amount of heat at the spindle motor.

Sony is claiming transfer rates of between 2.7 and 6.9Mb/sec, an impressive increase over the 2X drives. Like the drives currently on the market from Hitachi and Philips, the Sony unit is bundled with the RealMagic Hollywood Plus MPEG-2 decoder card – unlike the Creative Labs DVD fully integrated solution which uses the company's own decoder, the DXR-2. The RealMagic card was easy to install and functioned perfectly once the driver diskettes were loaded up. An impressive decoder aimed at the home user who wants to convert their PC into a DVD player, the Hollywood Plus has S/PDIF output for Dolby Surround Sound, with its six channels available through a suitable amplifier. The Sony drive was recognised immediately, and we were viewing a DVD movie within seconds of rebooting the PC. To begin with we were running the movies on a powerful PII350 PC, so it wasn't surprising that the images were clean and ran flawlessly. When we disabled the MPEG-2 card in the hardware profile and ran the film using the popular Zoran software supplied, the processor couldn't quite cope with the extra workload of decoding the MPEG files through software, and the film began to drop frames and lose fluidity. Bearing in mind that the processor was a PII350, the poor soft-DVD performance makes the point quite succinctly that a 5X DVD drive won't make much impact on performance. The bottleneck in the system occurs with the CPU being unable to perform the processing task without hiccups.

PCW DETAILS

★★★★

Price *£249 (£212 ex VAT)*
Contact *Sony 01932 816660*
www.sony.co.uk
Good Points *Excellent picture quality and sound.*
Bad Points *Sony hasn't come up with its own decoder yet.*
Conclusion *An impressive way to turn your PC into a DVD player.*

Panasonic **SR8582 DVD-ROM**

Keeping up with new technology needn't cost the earth and can sometimes even make sense. With the DVD revolution seemingly around the next corner, it would be a short-sighted individual who replaced an ageing or ailing CD-ROM drive with a new model that lacked the ability to play this next-generation media. Panasonic's drive-only option is a cost-effective way of preparing for the DVD revolution. Straight out of the box it's a simple upgrade, slotting neatly into the 5.25in gap left by a retiring IDE CD-ROM drive: hide the DVD logo, and it would be hard to tell what kind of discs it accepted. In terms of CD-ROM performance, tests placed it in an equivalent position to mid-range drives, peaking out at 25X performance. Added to this, of course, is the ability to run DVD-based software at double the standard speed when it becomes more readily available.

One area that is lacking is MPEG-2 capability, which would allow the playback of movies on DVD Video. As our tests on the Sony drive [*above*] show, you should not depend on your CPU alone to play back DVD movies satisfactorily through software. However, many modern graphics cards come with this capability built in, so movie buffs should check their PC before writing off this drive on that count. Movies will probably be a key consideration when purchasing the drive, though, since the majority of currently available DVD software is still restricted to video.

Third-generation models from other manufacturers are waiting in the wings, although these are likely to be priced at a real premium while the early adopters take first pickings. For those of us willing to accept less for a more reasonable price, this second-generation drive balances a significantly lower price with a creditable performance.

PCW DETAILS

★★★★

Price *£147 (£125 ex VAT)*
Contact *Panasonic 0800 444220*
www.panasonic.com
Good Points *Good balance between price and performance.*
Bad Points *No MPEG-2 capability for running available DVD software.*
Conclusion *A convenient path into DVD without premium pricing.*

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Digital Camcorders

Your modest attempts at filming family and friends could benefit greatly from a switch to digital.

With the advent of digital TV, film and TV programme makers are switching to digital as the ideal way of recording. But it is not just the professionals who get to use the best equipment. Since the first digital camcorders appeared back in 1997, they have become increasingly popular for two fundamental reasons: they produce better-quality video and audio, and the images they capture can be copied without degradation in quality.

Digital camcorders work in much the same way as digital cameras in that the image is captured using a CCD (charged coupled device), then the signal produced is converted into a digital format and saved onto a storage medium. Unlike photographic film, however, video is relatively low resolution: PAL displays images at 768x576 at just 25 frames (or 50 fields, i.e. interlaced frames) per second.

Digital video offers definite advantages over analogue, giving crisper edges and finer details, and as there is no signal interference you won't get those annoying white lines across the picture. In addition, the audio track is recorded in 16-bit, which gives CD-quality sound.

But the most compelling reason to opt for digital over analogue is that the quality is not reduced when you copy it. Each time you copy an analogue signal, "generational loss" occurs, meaning that the image quality is degraded. The more times you copy, the more degradation that occurs, which can cause problems when you need to edit film more than once. Digital images, on the other hand, can be copied as many times as you like without fear of degradation, which again has a knock-on effect with degradation-free editing.

On the downside, digital video requires a fair amount of room on whatever storage medium to record just a few seconds of video. For each pixel of a single frame of PAL video, three bytes of data are require to store its red, green and blue colour components. So, one frame needs 768x576 x 3 bytes, making 1.266Mb before compression. Multiply this by the 25 frames needed each second for the eye to see continuous movement, and you have a massive 31.64Gb requirement for just one second of video. And this is not even using the high resolutions and refresh rates of HDTV. The obvious answer is to compress the data, and there are numerous ways of doing this, notably DV and MPEG.

Digital Video (DV)

The most common format used by digital camcorders is DV (digital video). Panasonic and Sony were the first to use this standard on their camcorders, although Panasonic did not use the DV output facilities included as part of the DV standard. Both companies have announced their own extensions to the standard – Panasonic with PVCPRO in '95, and Sony with DVCAM in '96, although for their consumer digital camcorders both manufacturers have stuck to a more basic form of DV, in common with just about every other maker of digital camcorders.

DV uses a three-stage process to compress data. The first stage uses discrete cosine transform (DCT)

Canon DM-MV1

You could be forgiven for thinking that the DM-MV1 is actually a stills camera. It has been designed specifically to look like an SLR, which has its good and bad sides. It has easy-to-use buttons, all placed where you can easily feel for them as you operate the camera. It has a viewfinder, but only a very small LCD screen that tilts backwards, making it hard to use in sunlight. However, while the design suits an SLR where you need to hold the camera still, it works less well for video where you want to move the camcorder around. Added to this, the DM-MV1 is quite heavy at 930g (just over 2lbs) and while there is optical image stabilisation built in, this reviewer found it all too easy to get wobbly shots. The quality of the video was high, however, helped by the progressive scanning technique of the CCD, which takes a full frame 50 times a second, instead of 25 frames a second from 50 interlaced fields.

Price £1,500 (£1,277 ex VAT)
Contact 0121 680 8062
www.canon.co.uk

Panasonic NV-DS77

Cute, very, very cute, is the only way you can describe this adorable camera. At just 590g (1.3lbs) it is light, you can easily hold it in one hand, and there is a stabilising function to reduce camera shake. Your fingers are automatically positioned over the relevant buttons, such as the wide and telephoto control. Again this control is smooth, and gives you 10X optical zoom. The flip-out screen is a huge 3.8in across. This makes a big difference when trying to line up your shots, but it will eat your Lithium Ion batteries for breakfast. To compenste, Panasonic has included a good viewfinder and a battery recharger which can hold two batteries at a time. The 680,000 pixel CCD gives an excellent picture.

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Sharp **VL-PD1**

The most noteworthy feature on this camcorder is the 4in flip-back, touch-screen LCD. The screen folds flat back against the body of the unit so you can play back your recorded video with the screen at a comfortable angle. It will also turn around so you can film yourself, although as you will more than likely be looking to one side at the screen, rather than at the lens, this can be less successful than it seems. The functionality is controlled by touching the on-screen menus, but this quickly covers the screen in sticky fingerprints. The viewfinder is fixed in place so you cannot choose the most comfortable viewing angle. The focusing is sluggish in poor light, and the telephoto (40X digital but no optical zoom) has a horrible habit of sliding back to the default setting. Still, at 635g (1.4lbs) it is light and it does have a larger than normal Li-Ion battery to give a claimed two hour battery life.

Price £1,200 (£1,021 ex VAT)
Contact 0800 262958
www.sharp.co.uk

Hitachi **MP-EG1A**

While not new, this camcorder does stand out from the crowd. It is the only one we saw which does not use MiniDV cassettes, instead recording in MPEG-1 straight on to a PC Card hard disk, and so feels like a camcorder intended for use with a PC. There is no viewfinder, just an LCD screen, and no optical zoom although it does have 6X digital zoom. The head swivels round 180 degrees to capture video at any angle, and all the buttons for operation are on the back panel. The unit is extremely easy to get to grips with, as everything is self-explanatory. Through MPEG-1 video is recorded at a very low resolution, just 352x240, but still images can be captured at 704x480. The hard disk supplied is 260Mb, which should store 20 minutes of video.

Price £1,000 (£851 ex VAT)
Contact 0181 849 2000
www.hitachi.co.uk

compression, which strips away information that cannot be seen by the human eye. It separates the information from each pixel into brightness and colour and then samples this, favouring colour over brightness, which gives a highly accurate colour representation but cuts down the data by a third. It is compressed further by bunching colour information in adjacent pixels, and finally, hardware compression and an algorithm similar to that used by M-JPEG scrunches the information down even further.

The DV standard also supports PCM (pulse code modulation) stereo, a marking you might find stamped on the speakers of your digital camcorder. PCM refers to a system for digitising analogue sound. Using it, you can either record 16-bit audio — i.e.CD-quality audio — or in 12-bit mode you can record two pairs of audio tracks, one for stereo sound recorded at the time of the video and one for music or narration added later. Probably of most relevance for PC users is that it supports IEEE 1394 as a means of transferring the digital video from the camcorder to a PC. We'll look at 1394 a little further on [*p223*].

DV is recorded onto MiniDV cassettes. These are tiny things, but can hold a whole hour of video. They also have the advantage of having very low drop-out rates, unlike Hi8 which readily loses information, no matter how new the tape.

Not all manufacturers have adopted DV. Two years ago Hitachi released a digital camcorder based around the MPEG standard. Although this camera is relatively old, it is still one of the better cameras for PC users.

MPEG

MPEG comes in three flavours:
- the original MPEG-1 used as an alternative to QuickTime and the like;
- the widely supported MPEG-2; and
- the up-and-coming MPEG-4, intended for use in interactive set-top boxes.

The MPEG-2 standard is becoming ubiquitous since it has been adopted as the compression standard for DVD. It achieves a high compression rate by using the JPEG algorithm, a "lossy" compression standard, meaning that data is stripped away to reduce file sizes although the reduction cannot usually be seen by the human eye. It then stores only the changes between one frame and the next, so any data which stays the same for each frame is automatically dumped. This results in variable compression rates.

MPEG-2 allows for various resolutions and frame rates, supporting everything from PAL and NTSC through to HDTV and CD-quality audio.

MPEG-2 supports everything from PAL and NTSC to HDTV and CD-quality audio

However, on all but the most powerful systems, decoding MPEG-2 for playback will require dedicated hardware. Coding MPEG-2 requires considerable processing power and it is probably this stumbling block that has prevented the standard from being more widely adopted on camcorders.

As MPEG-2 is the default standard used by DVD, all digital TVs will be able to display MPEG in the future. It should be pointed out, however, that DV and MPEG are not compatible: if you want to input an MPEG file into a DV camcorder, you will have to first convert it to analogue and then reconvert it into DV format. Of the cameras we looked at for this group test, only the Hitachi MP-EG1A used MPEG-1 as its compression format. As a result, it was the only one to record its data not onto DV tape, but onto a PC Card hard disk. For the PC user this is perhaps more convenient than having video held on DV tapes, as the data on the PC Card disk can be quickly downloaded directly onto a notebook, so overcoming the problems associated with the other connections offered on digital

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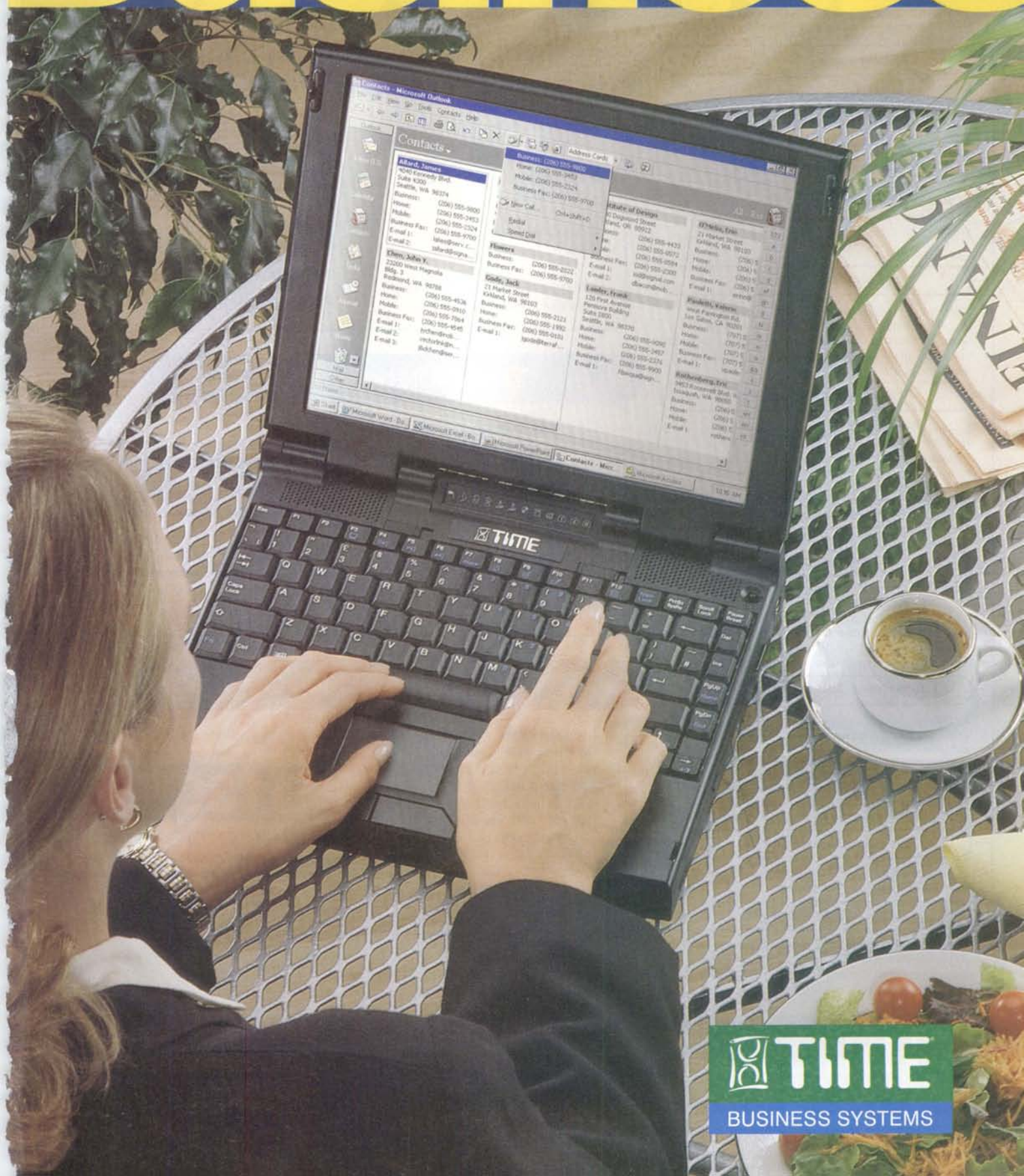

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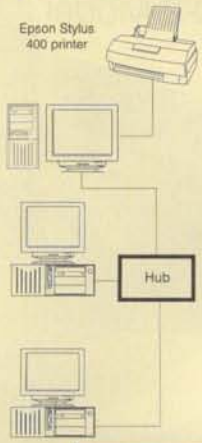

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TBSOL3A

Sony DCR-PC1

Sony was the first manufacturer to produce a digital camcorder and, like in so many areas, its products are considered some of the best around. We first looked at the DCR-PC10 (*pictured*); this has now been replaced by the DCR-PC1. The PC1 looks very similar and has similar features to the PC10, but is 25 percent smaller, making it around the size of a conventional compact film camera. Its small size, light weight and well-placed buttons make it very easy to use. Both camcorders have optical and digital zoom, 12X and 150X respectively on the PC10 and 10X and 120X on the PC1. Both have good-quality lenses, LCD screens and viewfinders, and Super SteadyShot image stabilisation. However, the small size of the PC1 makes it the most desirable of the two, while its excellent lens makes it one of the best small digital camcorders.

Price (PC1) £1,400 (£1,191 ex VAT)
Contact Sony 0990 424 424
www.sony.co.uk

camcorders. However, using MPEG-1 the HItachi camera captures images at 352x240 pixels only.

Connections

The ability to capture clear, sharp images is nothing if you cannot download those images to another source for editing and playback. For PC users, the best thing about digital video is that it is in the right format for them to download direct to the PC without analogue-to-digital conversion. With the exception of the Hitachi, all the cameras we looked at had three connections: composite, S-Video and DV-out. Some also provided a SCART socket for connection to a VCR, although the ones we saw only took a composite feed, not RGB. In fact, none of the cameras provided a direct RGB connection, which was a shame, as this would give good-quality playback on a TV. S-Video and composite are standard on camcorders, TVs and video capture cards. S-Video gives a far superior picture to composite, as it separates colour information from brightness and transmits them in two separate channels over the cable. It favours brightness over colour, just as TV signals do, because the human eye detects brightness better than colour. Composite just takes everything and squidges it all down one video channel. However, both these connections are analogue and will convert the digital signal to analogue before squirting it down the cable, so your crisp, clear digital video will be marred at this point.

For high speed and the best quality, you need to look for DV-out, or iLink as some of the camcorder manufacturers call it, or 1394 as everyone else knows it. It is the perfect bus for digital editing because it can transfer data at 100, 200 or 400Mbps – much faster than USB and, at the higher speeds, faster than 100BaseT Ethernet networks.

IEEE 1394

You can set up peer-to-peer networks using any IEEE 1394 devices. This means you don't have to use a PC at all, but can simply connect one 1394 device directly to another. However, 1394 is expensive to deploy as it needs two chips per device – one to handle the physical layer and one to handle the link layer in the connection protocol. Therefore, it is over-specified to handle the low bit rates needed for devices such as scanners and keyboards, but is perfect for devices needing high bandwidth.

At present, few PCs come with 1394 as standard, although it could easily be put on to motherboards in the future, together with USB, and many hard-disk manufacturers are considering adopting it in the future rather than SCSI. Adaptec has had a SCSI/1394 combo card, the AHA-8945, for over a year although it still costs £376 (£320 ex VAT). The much cheaper Adaptec AHA-8940 card only copes with still images over 1394.

Most digital camcorders come with a 1394/DV connection, not so they can be connected to PCs, but so that they are ready for the new wave of digital VCRs which are now appearing. Looking through the manuals that accompany these digital camcorders, you could be forgiven for thinking that no camcorder was ever meant to be connected to a PC. The only manual that even made mention of a PC was for the Canon, and then it was only to mention that still digital images could be downloaded over the serial port. However, most camcorder manufacturers do provide cables for 1394, so if you have the right connections on your PC or video, pat yourself on the back for having made some excellent purchasing decisions.

ADELE DYER

Taking stills on your camcorder

If you have a digital camcorder which lets you take still shots, why would you need a separate digital camera? Canon even tries to convince you of the convergence of these two mediums by making the DM-MV1 look and feel like an SLR camera. But mixing the two does not always make sense. Firstly, the resolution of video is low, and so the CCD used in most of these camcorders is correspondingly low. Typically, the stills images will be just 640x480 pixels, which is low compared to most of the latest crop of digital cameras. Printing an image of this size will give you a photo 2.1in by 1.6in at 300dpi or 4.3in by 3.2in at 150dpi. If you simply want images to put on a web site, this should be fine, but if you want to make high-quality prints, invest in a separate digital camera. Pulling images off the camera isn't easy, either. Canon provides a serial link to a PC and the Hitachi's images can be pulled off using the PC Card, but otherwise it's a fiddly job. Searching for the right image on a DV tape which can hold 500 still images is time-consuming and difficult unless you use special software.

Digital camcorders do not come with some of the extras which are needed on a stills camera: there is no flash as standard on any of the cameras we saw, and only the Canon has an optional flash attachment.

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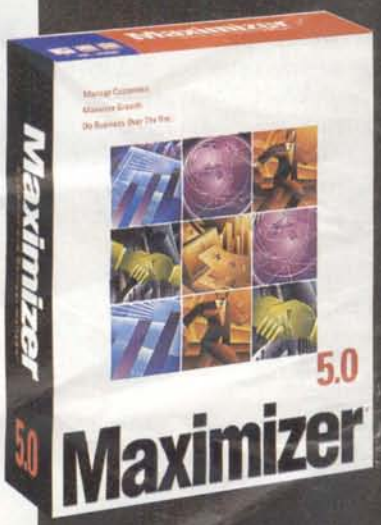

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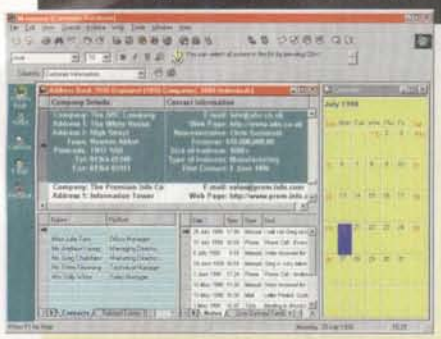

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Video Capture

Everything you need to know about capturing and saving full-motion video.

TV tuner cards and video capture cards are not exactly new kids on the block, but they have been dropping sharply in price and even appearing on multi-purpose graphics cards. Saving moving video like this is resource-intensive. A 320x240 image, which is far from full-screen size, will occupy, on average, 2 bytes per frame. At 25 frames a second, and with a 3:1 compression ratio, you'll find yourself eating up your hard disk at a rate of 1.2Mb per second. A 30-minute clip of this size would therefore occupy a staggering 2.1Gb. But there is light at the end of the tunnel in the form of Digital VCR 2.0 from ATi. By reducing the quality and almost halving the size to 176x144, it squeezes 5.5 hours onto a 2Gb drive.

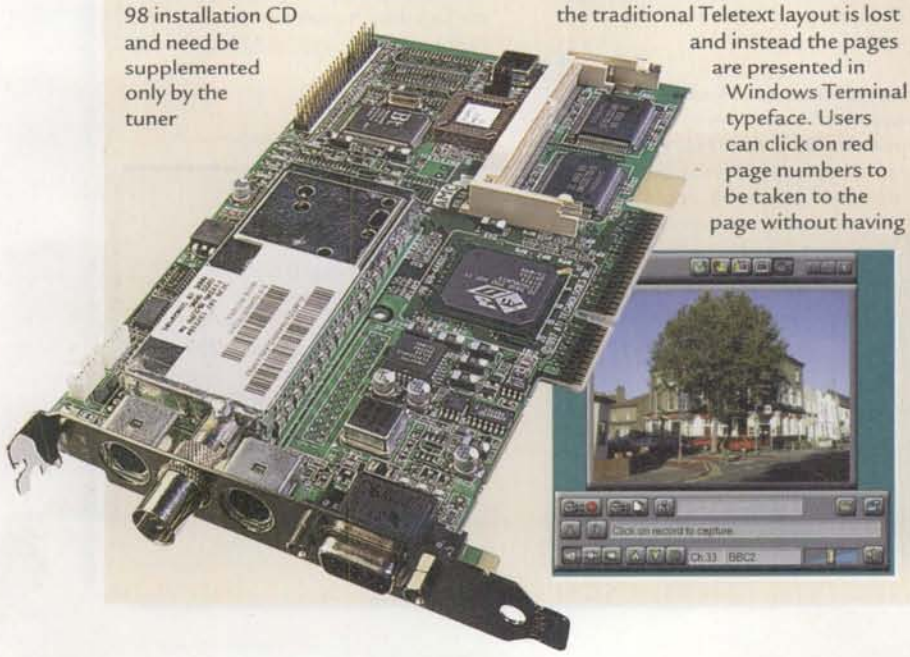
If you still want to capture full-motion video, disk space should not be your only consideration. Translating the analogue signal into digital form and writing it to disk makes heavy demands on your processor. If you're running a 90MHz Pentium, you are unlikely to be able to capture anything more impressive than around 15fps, even at less than 320x240 resolution. Some cards, specifically the Matrox Marvel G200 [*p226*], include utilities to tailor video capture rates to your hard drive. Older drives are slower and unable to keep up with the high data transfer rates necessary. With over 3Mb of information being sent to it each second, anything more than a couple of years old is likely to start dropping frames and produce in a jerky result when you try to record full-screen PAL input.

Because of the difference in the way a computer monitor and a television are constructed, further distortion can occur. This is particularly evident when the camera or a subject in the frame makes a swift movement. Because video images are interlaced, with every odd line being drawn before the even lines are even considered, the picture can have changed between line one (the first odd line) and line two (the first even line) being drawn. This sometimes results in horizontal black lines across the image. This is less evident on a TV because the screen is coated with "slow phosphor". This takes longer to cool than the coating on a computer monitor and so the image on the odd lines is still visible while the even lines are being drawn.

If you want to capture full-motion video, disk space should not be your only consideration

ATi All-In-Wonder Pro

The All-In-Wonder Pro has made a few appearances in high-end home PCs submitted for *PCW* group tests, and it's easy to see why. Available in both PCI and AGP versions, this graphics card incorporates TV and Teletext support and is supremely easy to install. All the necessary drivers can be found on the Windows 98 installation CD and need be supplemented only by the tuner software on the bundled CD. The Teletext decoder incorporates TV Online, which gives a web-like slant to the rather primitive Teletext. The only channel we could find broadcasting to a UK audience and using this technology was German station ZDF, on the Astra satellite. When set to "multimedia mode", the traditional Teletext layout is lost and instead the pages are presented in Windows Terminal typeface. Users can click on red page numbers to be taken to the page without having to type in the number. For traditional users, it offers the option of retaining Teletext's original look and feel. Images can be captured as either full-motion video, a series of stills or a one-off snapshot from the same interface that is used for viewing TV or video input, while the bundling of MGI VideoWave allows users to refine their captured clips and construct attractive presentations or home videos.



PCW DETAILS

★★★★★

Price *£129 (£109.79 ex VAT)*
Contact *ATI Technologies 01628 533115*
www.atitech.com
Good Points *A well established, easy setup.*
Bad Points *None to speak of.*
Conclusion *A good all-rounder for the home power user.*

Computer monitors, being built for accuracy rather than brightness, cannot enjoy this luxury.

Manufacturers attempt to combat this in one of two ways. The most obvious method is to de-interlace by keeping the odd lines on the screen while drawing the even lines between them. An alternative is what is known as vertical interpolation. Here, the even lines are ignored and only the odd lines are drawn. The card leaves enough space between each line to allow it to compare one odd line of pixels with the next (5 with 7 or 29 with 31) and use a row of "average" pixels to fill up the gap. Specific TV commands, in the form of Intel's Intercast, are incorporated into Windows 98. This allows broadcasters to combine their programmes with HTML elements that provide interactive programming and online TV guides. Although Intercast was used extensively during the 1996 Olympics in Atlanta, it is now in short supply.

On these pages we look at a small selection of cards catering for those interested in the merging of TV and PC technologies. Not all suit every need. The Studio 400 from Pinnacle excels at video editing but cannot tune into a TV broadcast. The Hauppauge WinTV, which can, supplements your graphics card, while the Marvel G200 from Matrox replaces it and touches most other bases at the same time.

In short, it is up to the individual to select the most appropriate product to meet their needs.

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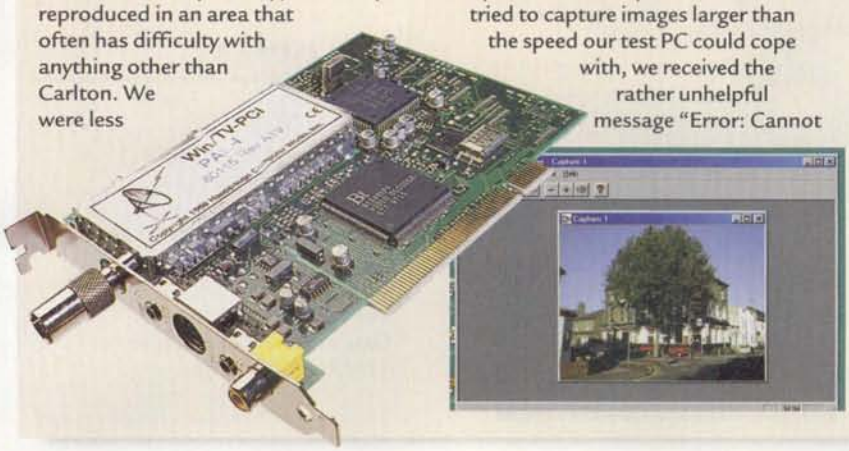
Hauppauge **WinTV**

Installation of this card was simplicity itself. After it was popped into a spare PCI slot, Windows detected the new hardware and installed the relevant drivers from CD. We told it in which country we would be using it to watch television and it then performed a scan of all available channels within its frequency range. Using a standard roof-mounted aerial it managed to tune in to far more channels than any standard TV using the same connection. Picture quality was exceptional, even when resized to 800x600, with both Carlton and Anglia flavours of ITV (from London and Norwich respectively) flawlessly reproduced in an area that often has difficulty with anything other than Carlton. We were less impressed after increasing our screen resolution to 1024x768, when vertical interference started to appear. Downloading Teletext pages was easy, although we were unable to display both Teletext and television on the same screen — it caused a lot of interference and made both indecipherable. A supplied lead allowed us to connect the line-out channel to the line-in channel of our sound card. This tuner does not replace the graphics card.

The video capture facility is very basic with "About" being the only option on the Help menu. When we tried to capture images larger than the speed our test PC could cope with, we received the rather unhelpful message "Error: Cannot open the video input device" and had to work out how to solve this ourselves — even the manual didn't help. When we finally managed to capture video it performed well with small frame sizes, but it got so carried away that the icon turned into a permanent hourglass and the only way we could stop recording was to hit Ctrl-Alt-Del. This is in spite of the fact that the software limits captured frame sizes to 320x240.



PCW DETAILS

★★★

Price *£79 (£67 ex VAT)*
Contact *Hauppauge 0171 378 1997*
www.hauppauge.co.uk
Good Points *Great TV picture at 800x600 resolution. Strong reception. Easy to install.*
Bad Points *Cryptic errors. Interference in some conditions. Could not display TV and Teletext together. Difficulty with video capture.*
Conclusion *Cheap and cheerful, and would suit most needs.*

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Matrox **Marvel G200**

The Marvel is a shapely blue box that sits on top of your PC case and connects your external video and other equipment to the card that sits inside your PC. This AGP card replaces the standard graphics card, leaving you with no less free PCI slots than you had before installation. Setting it up was simplicity itself and we needed to change only one default setting to tell it the country in which we would be watching TV. An analysis of the hard drives in our machine followed to determine which had the best data transfer rate to support live video capture. When the tests had completed, we were able to capture full screen PAL (704x576) video at 25fps. The optional TV tuner has an impressive word-search function to scan subtitles and activate the recording function when it comes across a particular keyword, making it suitable for recording specific news stories.

Recording, it can take advantage of the MJPEG format, a Windows AVI (Audio/Video Interleave) format with extra compression used only by Matrox cards. A wide selection of complementary software ranges from games and conferencing to image- and video-editing applications. The only minor difficulty we experienced was in having to remove previously resident video drivers from our test machine before installing the Marvel, although this is unlikely to affect home users who will not be regularly swapping a number of graphics cards in a single machine.

PCW DETAILS

★★★★★

Price *£199 (£169 ex VAT), TV tuner upgrade £75 (£64 ex VAT), DVD Video £58 (£49 ex VAT)*

Contact *Matrox 01753 665544* www.matrox.com/mga

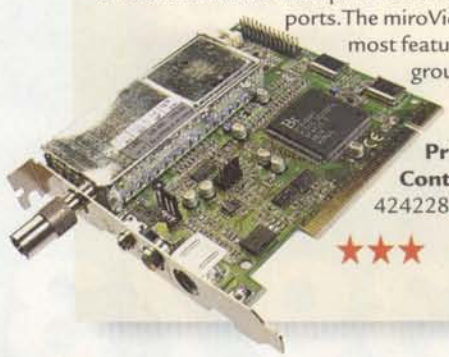
Good Points *16-bit colour TV reception at 1024x768. Graphics-card replacement. Subtitle word search. Ease of configuration.*

Bad Points *None to speak of.*

Conclusion *Those who want to spend this much money won't find better than a Marvel G200.*

Pinnacle **miroVideo PCTV**

We were disappointed that we were unable to install this card under Windows 98 and so were forced to revert to using either Windows 95 or Windows NT. Once working, it was simple to use. The picture wasn't nearly as good as that produced by the Hauppauge WinTV [*p226*] but we were able to view Teletext and broadcasts at the same time, making subtitles a practicality even if they were in a separate window. Full-screen 768x576 resolution avoids scaling the image and maintains a 1:1 ratio to the original broadcast. An interface on the open end of the card allows a radio tuner card to be bolted on to increase the product's range of features. The bundled VidCon32 software catered for video capture. Users have the choice of capturing a series of stills to make up their AVI files or can simply hit the Record button for full-motion video. Kai's Power Goo SE allows users to manipulate captured images. Quick data transfer is ensured through the implementation of PCI bus mastering technology, while virtually any domestic video source can be connected with the incorporation of VHS and S-VHS ports. The miroVideo may not be the most feature-packed card in this grouping, but at this price you can't complain.



Price £59 (£50 ex VAT)
Contact Pinnacle 01895 424228 www.pinnaclesys.com

★★★

Pinnacle **Studio 400**

The Studio 400 is slightly different to the other products reviewed here in that it is not a TV tuner or a graphics card but a dedicated video editor. The smart, purple box connects your PC to a video and camcorder, while the software makes it easy to import your video clips as a series of scenes that are displayed on the pages of a virtual on-screen book. These scenes can then be dragged and dropped on to the film strip at the bottom of the interface in the appropriate order. You don't need to preview your tapes to mark where the scenes begin and end. By playing them through the hardware, the purple centrepiece will recognise and mark where scenes begin, representing each new scene with a further thumbnail in the virtual book. On-screen titles and special effects are applied by dragging them on to the film strip. To save on rapid hard-drive consumption, the Studio 400 leaves the original footage exactly where it is. The only thing written to disk is a low-quality, highly compressed copy of the scenes that are not used in the completed production. When you have finished assembling your previews, the Studio 400's infra-red attachment lets you control your video and reassemble the film directly from the recorded originals.

Price £199 (£169 ex VAT)
Contact Pinnacle 01895 424228 www.pinnaclesys.com

★★★★

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Videoconferencing

The last time *PCW* took a look at videoconferencing, it was clear that the big players like PictureTel and VideoLogic dominated, and the technology hadn't wholly migrated down to the lower end of the market. That has now changed. Of the five products we have reviewed this time around, there are two high-end packages but three desktop video solutions, including one that doesn't require a PC.

There is now a gamut of products under £100 that have made budget videoconferencing a reality using a variety of media, from the internet through normal telephone lines, to LANs and on to high-speed ISDN lines. This is not to say, however, that videoconferencing is about to be possible from wristwatches. One day, maybe...

Grainy, murky images are still quite common when working with low-end cameras. Frame rates of between 5-15fps are common over a telephone link, which appears jerky to the human eye used to a typical video rate of 30fps. But as our experience with the Kodak DVC 323 shows [*opposite*], it is possible to get a good-quality picture that isn't at the expense of frame rate. More of the work of compressing and decompressing the images to get them through narrow bandwidths can be handled through software by increasingly powerful processors.

Low-end cameras usually fall into one or two camps: those that use expansion cards, and those that connect straight into the parallel or USB ports.

The professional view

In the professional solutions that hook up over LANs/WANs and/or ISDN lines, the quality of video camera is usually streets ahead of that available from the poorer cousins, and the picture benefits from the higher bandwidth available. Corporate videoconferencing is still the Next Big Thing rather than a current phenomenon, but with Microsoft and Intel renewing and pushing their high-end video-conferencing with NetMeeting and Team Server respectively, and IBM/Lotus acquiring two specialist companies, DataBeam and Ubique, this can only be good news for high-end users.

Intel ProShare Conferencing

Intel's ProShare system is a well established product, aimed at the corporate market for whom data transfer is as important as visual communication. The 200 was about to be superseded by the 500 at the time of going to press, a cheaper, superior option that uses the PII processor for decoding, rather than the ISA cards in the 200.

The ProShare can be set up to work with a modem or LAN, although using a modem means you work on data only, not audio and video. However, the system is really aimed at ISDN users. Other users will need the same connection of course, and the ProShare uses the H.120 data conferencing and H.320 video conferencing standards.

We set up the system to run over an ISDN line in the labs and it went relatively smoothly apart from installing the drivers. The hardware wizard couldn't detect the drivers from the CD automatically, as it said in the manual, so we had to browse through the disk to find them ourselves. Once we had done this, the rest of the setup was easy, and then we moved on to calibrating the camera. Connecting to another PC is relatively easy: type in the number of the person you want to call, and they are informed by a pop-up graphic.

◂THE ISDN CONNECTION MEANT THERE WAS LITTLE OF THE JERKINESS WE ENCOUNTERED WITH LAN/MODEM BASED SYSTEMS

The ProShare system also allows multipoint conferencing between three or more users, application sharing, and the option to work on shared data during the call. Using the Notebook function, the file is copied by the ProShare application, allowing users to work on the one file simultaneously.

PCW DETAILS

★★★★

Price *£1,327 (£1,129 ex VAT). ProShare 500 will be available for £586 (£499 ex VAT). A 500 upgrade kit is available for £370 (£315 ex VAT).*

Contact *Intel 01793 403000* www.intel.com

Good Points *Does everything you could want.*

Bad Points *A little troublesome setting up. Uses up two ISA slots.*

Conclusion *A classy videoconferencing solution.*

Kodak **DVC 323**

The grumbles around the office have been going on for over a year now; when, oh when, were manufacturers going to take up the USB (Universal Serial Bus) cause? With the market's acceptance of USB-friendly Windows 98, we are only now starting to see a notable number of products on the market.

The DVC 323 is Kodak's update to the DVC 300, one of the very first USB devices, and is an impressive piece of kit. Providing you have USB on your PC, and that it works, the installation is trouble-free. We wrestled with the camera for two hours on the first PC we tried, but to no avail. The drivers had to be updated from the Kodak web site, we were told. The PC finally recognised the hardware, but the new driver didn't fix the problem.

As if to thoroughly confuse us, the camera and software installed like a dream on the next PC we tried, and we were pleasantly surprised by what we saw. Kodak is using its own lens in the camera, and a 640x480 pixel CCD capable of taking video or stills, in up to 24-bit colour resolutions. It can manage 28fps in Wide Angle mode, and 30fps in Normal and Telephoto modes. The picture was sharper than most of the other cameras in this budget range, and even recording at 640x480 the frame rate remains high. The basic software was PictureWorks Live, which was a joy to use: instantly comprehensible, with lots of well thought out drag-and-drop. There is also fun to be had with Kai's Power Goo, included in the pack along with Microsoft's NetMeeting and CU-SeeMe.

PCW DETAILS

★★★★

Price *£160 (£136 ex VAT)*
Contact *Kodak 0800 281487*
www.kodak.co.uk
Good Points *User-friendly software and excellent-quality video, and it looks like a Star Trek phaser.*
Bad Points *USB can be a little temperamental.*
Conclusion *A great toy that's a joy to use.*

Pace **Colour Video Camera PCI**

Unlike some of the other low-end videoconferencing cameras around just now, the Pace Colour Video Camera PCI works, as the quicker-witted among you will have picked up from its title, in tandem with the PCI video capture card that comes with the camera.
The digital CMOS camera is one of the more unusual-looking cameras on the market, with its rubber-cased lens looking like an eyeball trapped inside the small, cylindrical design. It can sit on top of the monitor or be screwed into a camera tripod for more stability. The installation of the camera and card is simplicity itself, first fixing the card in a spare PCI slot and then attaching the camera to the port on the card. When we rebooted the PC, it recognised the card and camera and we loaded the drivers in from the CD. We were pleased to see additional ports on the PCI card for Composite and S-VHS inputs, enabling film from camcorders and VCRs to be captured on the PC, as well as a tuner card for watching TV.

This is a budget camera, a fact reflected by the picture; at best murky, at worst poor. With a maximum resolution of 320x240, the Colour Video Camera isn't about to produce film-quality video. Although this camera seems to be aimed at the home user who likes the idea of emailing videos of him/herself and doesn't care too much about perfect pictures, there was a wide range of accompanying software. The camera comes with two "video mail" packages, a full version of VideoLink, and a cut-down version of VDOPhone.
With business in mind there are several software solutions for live videoconferencing, and there is the option to install software that makes the camera motion-sensitive, turning it into a surveillance device.

PCW DETAILS

★★★

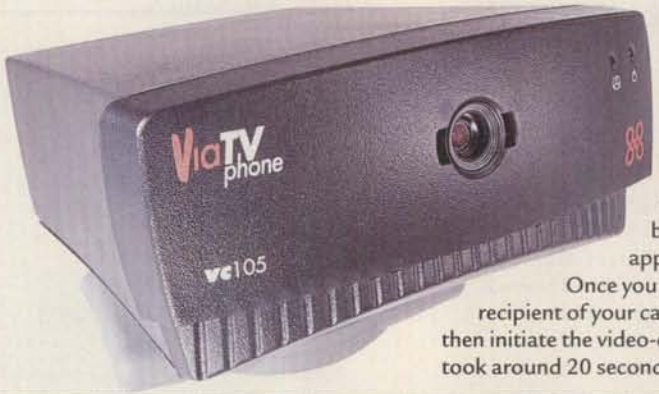
Price *£89 (£76 ex VAT). USB version also available at same price.*
Contact *Pace 0990 561001*
www.pacecom.co.uk
Good Points *Cheap. Easy to set up.*
Bad Points *You are made to suffer in terms of picture quality.*
Conclusion *You get what you pay for.*

*Via*TV Phone

The idea behind the ViaTV is simplicity itself; to take the PC out of videoconferencing. The ViaTV Phone sits on top of the television, and sends the pictures directly down the phone line through its own internal modem to another videophone. As well as being able to hook up to other ViaTV Phones, the camera can also make videocalls to any other videophones that use the H.324 standard for modem-to-modem connections over a PSTN (Public Switched Telephone Network).

The ViaTV Phone was a breeze to set up. The camera doesn't have to be placed on top of the TV, but this is really the most practical place to put it due to the length of the leads between camera and TV. The camera connects to the TV via the SCART socket on the back of the TV, and to the existing phone line via a two-way socket into which you plug the line from your telephone.

It took us about five minutes to set up ready for our first attempt at PC-less videoconferencing, and most of that time was spent dragging the TV close enough to the phone socket: a longer line would have been much appreciated.



Once you have rung the recipient of your call, you can then initiate the video-connection. It took around 20 seconds for the link to establish, with a connection speed of around 31Kb/sec. Using the buttons on the phone, you can bring up menus that can alter picture quality as well as frame rate. The picture at its "fine" setting was impressively sharp, but its frame rate dropped dramatically and any sense of continuous movement was lost. At the "fast" setting, the frame rate was very impressive although the picture was pretty awful.

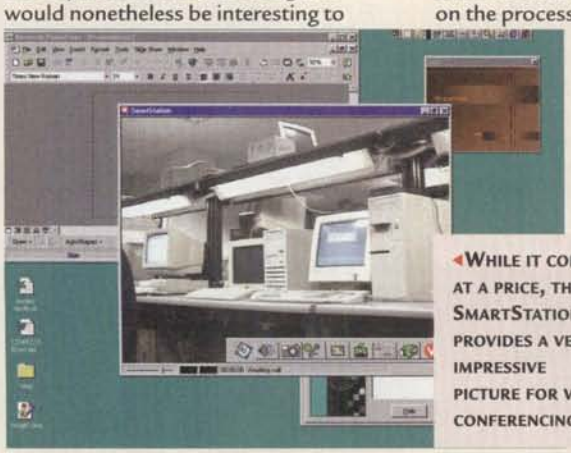
PCW DETAILS

★★

Price *£399 (£340 ex VAT)*
Contact *ViaTv 0800 980 8889*
www.viatv.com
Good Points *Simplicity itself to set up.*
Bad Points *You must sacrifice frame rate for picture quality.*
Conclusion *A neat idea that might catch on with a faster modem.*

Vtel SmartStation

Vtel is one of the key players in what is known in videoconferencing circles as "room" conferencing, where clients pay anything up to £20,000 for a set-up that allows whole boardrooms to communicate with each other. Rather than selling over the counter, its key market is corporates to whom money isn't a problem. Unlikely though it is that a small-business user is going to shell out the requisite readies, we thought it would nonetheless be interesting to see how the other half lives. We reviewed Vtel's Executive package that includes the same excellent 12X zoom camera the company bundles with its £20,000 set-ups. Not for the faint-hearted, the SmartStation comes with two hulking codec cards, one PCI, one ISA. It is relatively easy to set up, but you will need at least a P133 processor as part of a robust system. The video is excellent quality, but in spite of the two codec cards it still makes certain demands on the processor. Once it was up and running, we were knocked out by the quality of the video — until we realised it was a local image and hadn't been compressed for transit. Even when we were hooked up to another user, the picture was still impressive over an ISDN line, although it can be configured to run over LANs and modems. The package includes Microsoft's NetMeeting software that allows multiple users to share applications.



◂WHILE IT COMES AT A PRICE, THE SMARTSTATION PROVIDES A VERY IMPRESSIVE PICTURE FOR VIDEO-CONFERENCING

The SmartStation has a particularly intuitive user interface, an icon-driven menu that sits on the edge of the SmartStation window and can be customised depending on your needs.

PCW DETAILS

★★★★

Price *The SmartStation is sold in varying configurations from £1,600 - £20,000.*
Contact *Vtel 0118 955 3208*
www.vtel.com
Good Points *Excellent camera and software.*
Bad Points *Class kit comes at a price.*
Conclusion *The business.*

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PCW02

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The technology to recognise fingerprints is here. Nik Rawlinson investigates the case in hand.

Pointing the finger

It may all sound like something taken from the pages of Orwell's *1984*, but governments and the military have been developing an efficient means of singling out a person based on bodily characteristics. Recognition of this type is called Biometrics, a technique for measuring a physical human attribute and comparing it to a database of registered characteristics for identification purposes.

Biometrics incorporates everything, from hand geometry and vein pattern recognition to retinal and iris scans, and the analysis of voice patterns. Perhaps the most useful aspect, though, is fingerprint analysis. It has been used worldwide for many years in tracking criminals, but the technology is now beginning to pay dividends for the ordinary bod on the street as a way of bolstering currently inadequate PIN or password-based security systems. In Spain, the government is currently extending an extensive trial of smart card technology. Initially rolled out across a sample of a million citizens, the card, bearing a fingerprint, provides access to social security and healthcare benefits. In the States, the military is constructing a similar system at its base at Fort Still. A smart card, access to which is controlled through print recognition, will give recruits access to a maximum of $250 spending money a week.

The BioAPI consortium (Compaq, IBM, Microsoft, Identicator, Miros and Novell) have set out to develop a standardised way of analysing fingerprints so that the technology can be built into everything from network log-ons to protecting documents in applications like Microsoft Word. When Digital TV takes off, manufacturers see biometrics as a way of protecting the set-top box – particularly useful for barring adult channels from children.

Two products, from Compaq and Shuttle Technology, will bring this type of fingerprint recognition to the desktop. Their smart, small devices hook up to the PC's parallel port, scan the skin surface pressed to the lens and reduce the complicated tangle of creased skin to a mere template of key points. These are the points where the lines change direction, merge or end. Around 40 of these points are marked, and the rest of the image is discarded. Forty may not sound like much, but it should be remembered that in most countries only 12 matching points are necessary for a fingerprint to convict a criminal in a police investigation. These points are encrypted and passed to the domain server that then compares the points to a database of registered users, only granting access to matching prints.

▲ QUICKER THAN A KEYBOARD, PASS FIRST TIME WITH A NIFTY FINGERPRINT READER LIKE THIS ONE FROM COMPAQ

But how accurate is such a system? Compaq's setup process allows the system administrator to select the level of accuracy, ranging from one mistake in 1,000 (i.e. a valid user is rejected or someone without authority gains access) to one in 100,000. The fact that no user will ever place their finger in exactly the same place twice has also been taken into consideration. Shuttle Technology claims its product will allow for a 30-degree alteration in angle between the finger and the comparison pattern. Ah, you say, but what about fingers changing with age? Sorry, they've beaten you there, too. Your fingerprints just don't change. Al Capone tried to evade capture by dipping his fingers in acid to destroy his prints. It worked... for a while. Little did he know they would grow back with exactly the same pattern as before.

Al Capone tried to evade capture by DIPPING HIS FINGERS IN ACID to destroy his prints. They grew back with exactly the same pattern as before

Toby Howard reports on how a net user can have a physical presence at a web site.

Remote control

Being there is not an experience we normally associate with browsing the web. Although we speak of "visiting" a web site, it's actually the other way around: we stay exactly where we are – it's the data that comes to visit us. But two researchers at the University of California want to change all this. They're experimenting with what they call "tele-embodiment" – giving a surfer a real physical presence at a remote web site, in the shape of a remote-controlled mobile robot. John Canny and Eric Paulos call their robots "Personal Roving Presences", or PRoPs <www.prop.org>. The idea developed from previous experiments with robots they called "space browsers", or blimps, small helium-filled remote-controlled balloons. An operator, controlling the blimp using a radio link and a Java applet in a web browser, would "pilot" it around a roomful of people, engaging them in conversation using the camera, microphone and speakers attached to the blimp. The idea was perfect for "happenings" at Electronic Art festivals, but the weight of the batteries and the instability of the balloons made them impractical. Next, Canny and Paulos came down to earth, experimenting with "surface cruisers", small-scale mobile robots again with a wireless connection to the web. Their latest PRoP looks a bit like a high-tech version of the dancing broomstick from Disney's Fantasia. The base is a small motorised cart with steerable wheels. On the cart is a battery pack and a PC with a wireless link. The cart supports the PRoP's "body", a thin vertical shaft 1.5m tall. At the top is the "head", comprising a video camera, microphone and speaker, and an LCD screen. There's also a small, motorised arm intended not for manipulating objects, but for "gesturing". The operator controls the PRoP via a simple web interface, moving and steering it with the help of real-time images from the PRoP's "eye". A video camera pointed at the operator's face sends the image to the LCD panel on the PRoP's head. The idea is that the operator, embodied as the PRoP, wanders around the remote scene, meeting people and chatting with them, or just "hanging out", as the Americans say.

PRoPs will bring a new dimension to global comms ... THE 'OUT-OF-BODY' EXPERIENCE may soon become a technological reality

▲NASA's Sojourner Mars lander has demonstrated that telerobotics is essential for space exploration

Canny and Paulos believe that the future lies with very simple robots with a few basic behaviours: moving, watching, listening, speaking, and displaying a video image of their web operator. The future, they say, is "telepresence for the masses". And they're not alone in wanting to go beyond the passive browsing that mostly characterises the web. Several tele-robots already attached to the web let you experiment with telepresence. Try to pick up some blocks with the simple robot at University of Western Australia <telerobot.questacon.edu.au>, for example; then zoom across to the opposite side of the planet, to the Carnegie Science Center's Online Telerobot <csc.clpgh.org/telerobt/>. You can even paint with a robot at "Puma paint" <yugo.mme.wilkes.edu/~villanov/>. The robot at this site holds a paintbrush which it can dip into one of four different pots: you choose the colour, tell the arm how to move and even how much pressure to apply to the canvas. Closer to home is the Bradford Robotic Telescope, high on the West Yorkshire moors <www.telescope.org>

Much of the cutting-edge research is coming from NASA <ranier.oact.hq.nasa.gov/telerobotics.html>, where the goal is to develop efficient telerobotic interfaces to control landers on future space missions. NASA demonstrated with the Sojourner Mars lander that telerobotics is essential for space exploration, and its future plans rely heavily on the "Interplanetary Internet" project (*see "Futures", PCW November 1998*). There's even a project coordinated by Carnegie Mellon University to allow public control of a lunar rover <www.ri.cmu.edu/lri/>

PRoPs and telerobotics will bring a new dimension to global communications, and instead of being a New Age myth, the "out-of-body experience" may soon become a technological reality.

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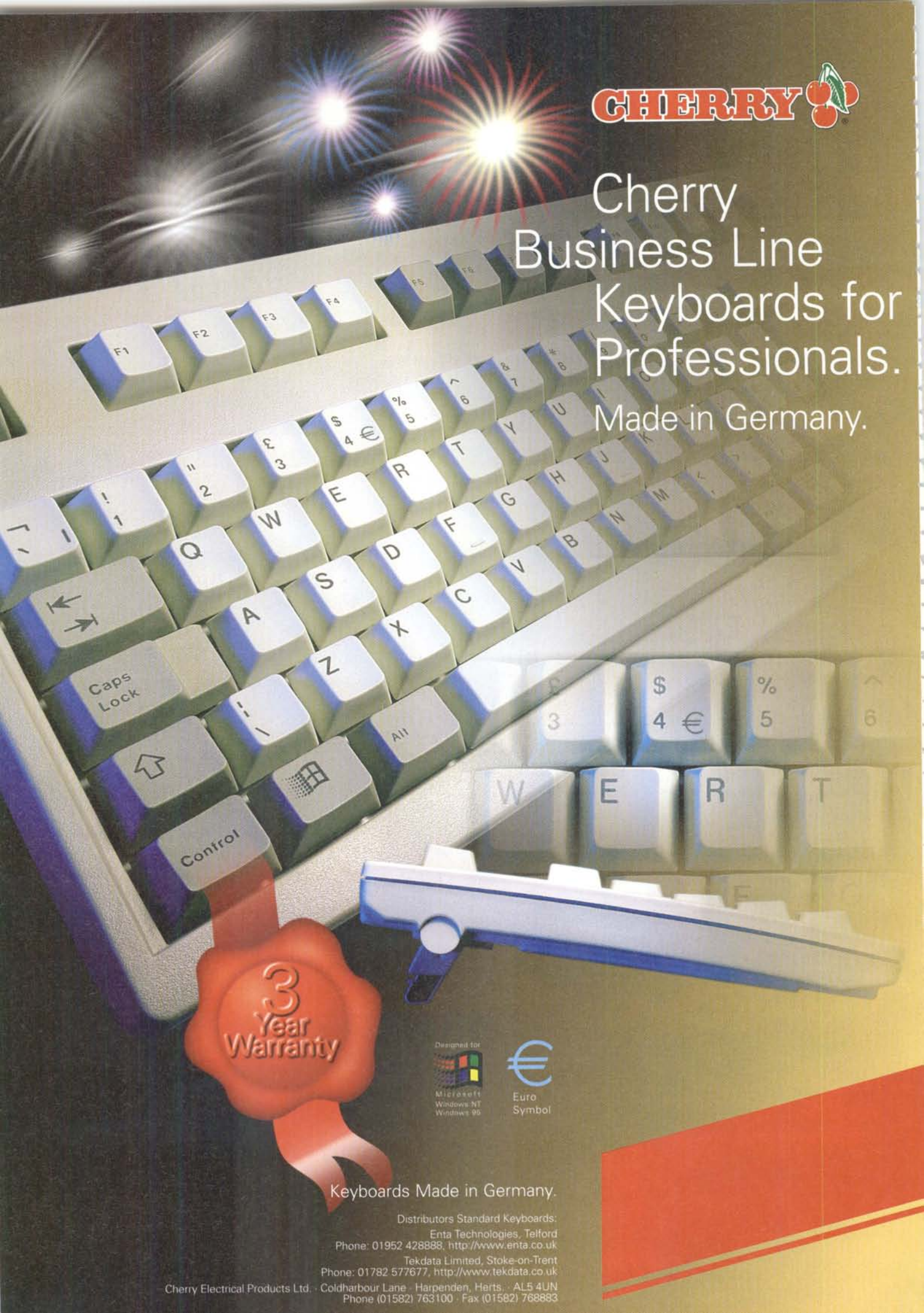
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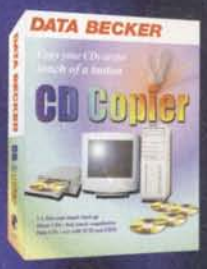

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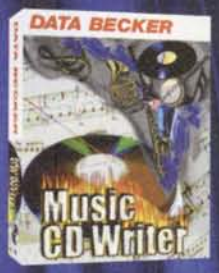

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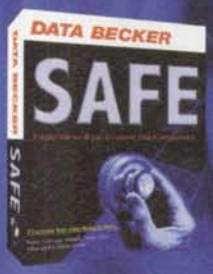

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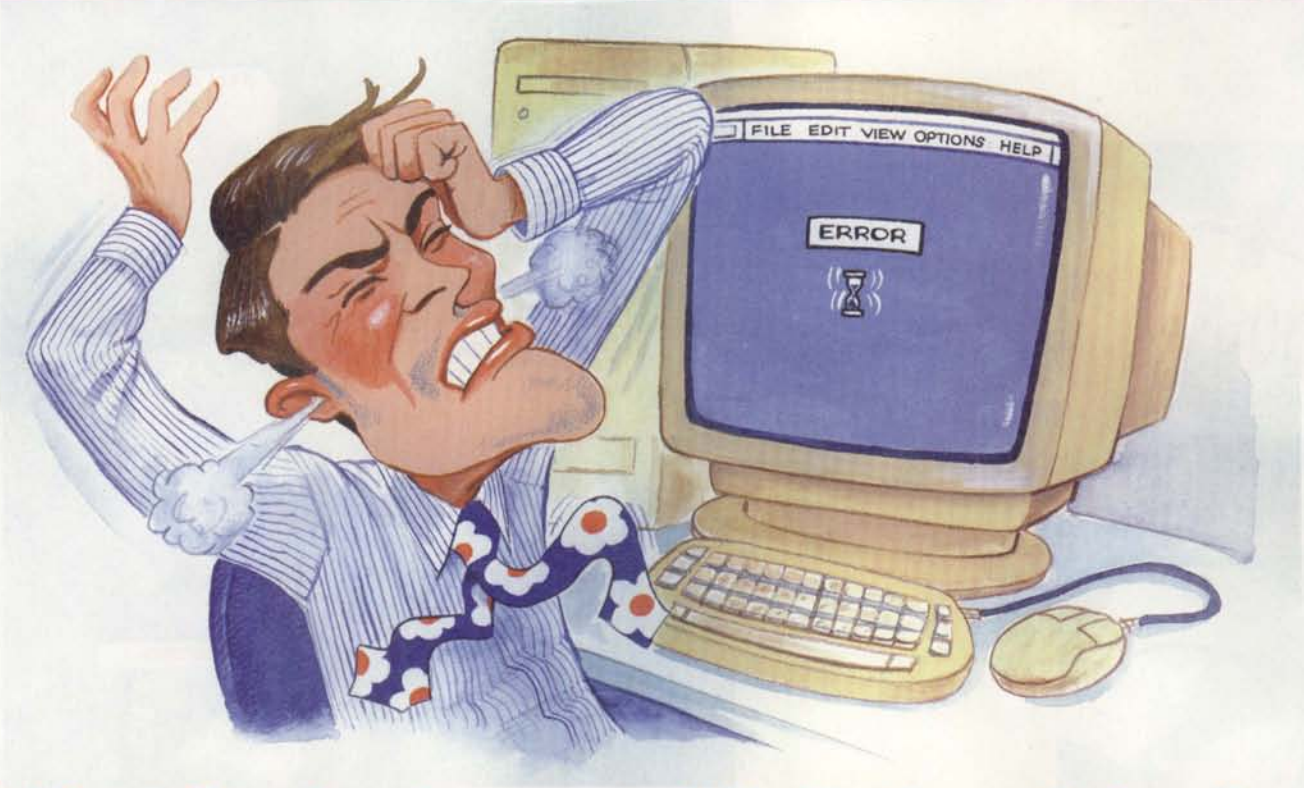

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hands on contents

Are you looking for that next great operating system? It could be coming sooner than you think – that's if you reckon **NT 5.0** is going to be the answer to your prayers. In *Networks*, Bob Walder takes a look at Microsoft's latest timetable for releasing this much-hyped upgrade and examines some of the **main features** of the pre-release copies. On the other hand, perhaps you're quite happy with Windows 95 or 98 but have been following Chris Bidmead's *Unix* column. If you've always wanted to try out the "free" **Linux operating system** for yourself but didn't want to sacrifice your Microsoft installation, follow the first instalment of our three-part workshop on running it alongside Windows. Even Cliff Joseph gets in on the OS swapping act this month, **emulating the PCs** we know and love on his Mac.

With Christmas on the horizon, many *Hands On* writers hint at what they would like to find in their stockings, while Mark Whitehorn thinks about all of those **festive photos** – and the headache he's going to have trying to file them in a database.

NIK RAWLINSON, HANDS ON EDITOR
NIK_RAWLINSON@VNU.CO.UK

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PCW Hands On on CD-ROM

Now it's easy to find that *Hands On* tip, trick, advice or review again – there's a whole year's worth of columns on our monthly *PCW* CD-ROM. So if that handy hint is on the tip of your tongue, don't sit and sweat: the answer is at your fingertips with our cover CD.

Loading up Linux

Chris Bidmead hears the call of all those readers longing to use the Linux operating system and, in the first of this three-part series, shows you how to make a start.

The email received file for my *Hands On Unix* column is bulging with queries from readers who would like to install the popular, free, Unix-like operating system called Linux, but, in approximately this order of priority: they're fearful that they'll mess up their existing (usually Windows) installation; or, they shy away from an operating system that seems to demand a lot of technical knowledge; or, they haven't a clue how to get started.

Fact of life

This three-part workshop is aimed to help Windows users who want to get started with Linux. Let me make it clear from the outset – I'm not a guru. I'm just this guy who happens to have been kicking around Linux, and other Unix flavours, for several years. You don't *need* to be a guru to run Linux, but if you want guru-type help, there's plenty of it about. The good news for you (and me) is that there's a lot of documentation out there. The bad news is that much of it is out of date – well, not really bad news, just a fact of life. When technology moves as fast as Linux, everything on which you lay your hands is automatically out of date to some degree. For Linux documentation, as for web pages in general, you need to learn to read like a good history researcher, critical of the content and conscious of the context.

If you turn to *Hands On Unix* (on page 269) you'll find some suggestions about where and how to start. Here, I am tackling the kind of real-life problems likely to arise with your own installation, but I cannot cover all eventualities. Contact me if you hit snags that I have not mentioned in these pages and we'll try to hack it out together [*"PCW Contacts", p244*].

```
This is the fdisk program for partitioning your drive. It is running
on /dev/hda.

Command (m for help): p

Disk /tmp/hda: 128 heads, 63 sectors, 620 cylinders
Units = cylinders of 8064 * 512 bytes

   Device Boot   Begin    Start      End   Blocks   Id  System
/tmp/hda1            1        1       21    84640+  83  Linux native
/tmp/hda2           22       22      148   512064   83  Linux native
/tmp/hda3          149      149      620  1903104    5  Extended
/tmp/hda5          149      149      275   512032+ 83  Linux native
/tmp/hda6          276      276      402   512032+ 83  Linux native
/tmp/hda7          403      403      419    68512+ 82  Linux swap
/tmp/hda8          420      420      620   810400+ 83  Linux native

Command (m for help):
```

▲ FIG 1 THE TRADITIONAL WAY TO DO THIS IS WITH FDISK. IT'S MORE FLEXIBLE BUT, AS YOU CAN SEE, LESS USER-FRIENDLY

My mate Marcus runs a Windows machine which he put together himself six months ago for less than £500. He picked up the motherboard with 32Mb of RAM and a Cyrix 200 processor from a UK company called Big Red at www.bigred.co.uk for £125. He added an old Mitsumi four-speed CD-ROM and a 515Mb Western Digital hard drive filleted from a defunct PC, plugged in an NE 2000-compatible Genius 2000 network card and an antique Western Digital/Paradise 90C31-based video card, then connected the whole thing up to a 14in monitor he picked up for £100.

I've picked Marcus' machine for a variety of reasons. I like its oddness: installing Linux on a standard machine can be too easy to be interesting. This one has a non-Intel processor clocked at 150MHz: hardly state-of-the-art, and therefore a chance for Linux to demonstrate its spriteliness at the cheaper end of the market. (Several readers of the *Hands On Unix* column have reported going up to the attic to retrieve an old 386 machine and loading up Linux to bring it back to useful life.)

You don't need to be a guru to run Linux

The other thing that appealed to me about Marcus's machine was that I could get Marcus to do most of the work. The first question was: where were we going to put Linux? The Western Digital IDE hard drive was dedicated to Windows 95. In theory we could shrink the Windows partition to make room, but this would be a squeeze for both Windows and Linux. We decided to put in a second hard drive.

Marcus cannibalised a four-year-old 520Mb Seagate ST3660A from another machine. "The hard disk install was very easy," he says. "There was a spare connector on the IDE cable and I established the new drive as a slave on the primary IDE interface, setting the switches according to the details printed on the drive cover itself." Many older drives may not have this key information handy, in which case it's worth quizzing the relevant web page – www.quantum.com or www.westerndigital.com, for example. If you can't find your drive there, check out the marvellous hard drive database maintained at www.mm.mtu.edu/drives/ by Chris Hooper.

The Linux distribution we chose was the Official version of RedHat 5.1. "Official" in this context means that you get some extra proprietary software, a nice manual and 30 days' free installation support. You can buy it from many places, including ordering it direct from www.redhat.com. Another option is the Linux Emporium here in the UK at www.polo.demon.co.

uk/emporium.html, where you can also pick up the GPL version (no manual, no support) for a couple of quid.

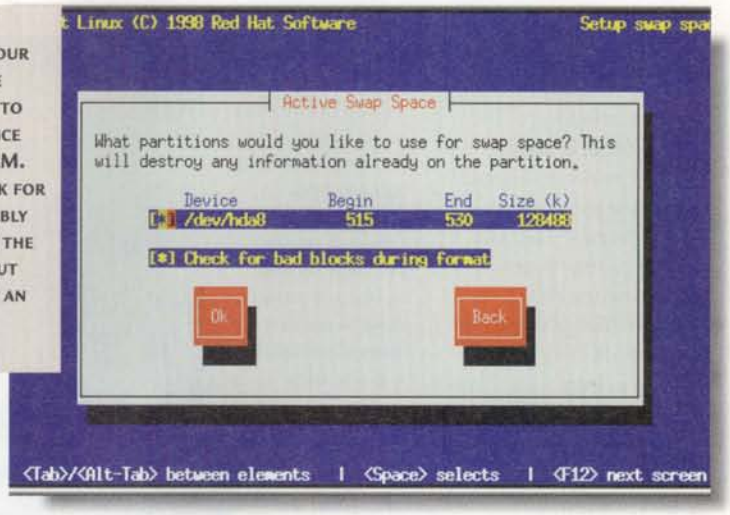
The Official RedHat distribution comes with a boot floppy (with the GPL version you need to manufacture your own from the CD) but we didn't have to use it because, like many recent PCs, the AmiBIOS v2.4 in Marcus' machine knows how to boot from a CD. This means you just have to insert the RedHat CD in the drive, switch on the machine, and after a moment or two you're looking at a character-based screen with a prompt that just reads "boot:".

Enter lilo

What do you do next? Well, actually, nothing. This boot prompt is being offered by lilo, the Linux boot loader program. The prompt is there so you can take advantage of the flexibility of lilo, but at this point all you need to do is wait a few seconds (or hit carriage return) and lilo will begin to load a copy of the Linux kernel (the core of the operating system) into the machine's memory from the CD and then automatically start running the installation program.

During this stage you'll see a number of messages sprinting up the screen as various parts of your hardware are detected. If they don't mean anything to you, just ignore them, although they're useful for diagnostics if things go wrong.

The opening screen puts up a welcome message and then trots you through some simple questions, like which language you want to use and what your keyboard type is. You're also given a choice of installation methods: you can even install over the network from a shared Windows drive. We settled for "Local CD-ROM".



▸FIG 2 SETTING UP YOUR SWAP PARTITION. THE RECOMMENDATION IS TO MAKE IT AT LEAST TWICE THE SIZE OF YOUR RAM. THE OPTION TO CHECK FOR BAD BLOCKS IS PROBABLY NOT NECESSARY WITH THE NEWER HARD DISKS BUT WE'RE INSTALLING ON AN OLDER DISK

The next screen asks if you want to install a new Linux system or upgrade an old one. We chose "Install" and were then presented with a choice of using Disk Druid or fdisk [Fig 1] to create our partitions. Both do the same job of allocating areas of the disk and preparing them for the new operating system, but fdisk is the techie tool and Disk Druid the (not much) simpler partitioner for beginners. Whichever you use, by default the installation procedure won't overwrite your existing Windows partition (or partitions). We were extra safe because the Windows stuff was on a different drive. However, partitioning software is potentially dangerous, so tread carefully.

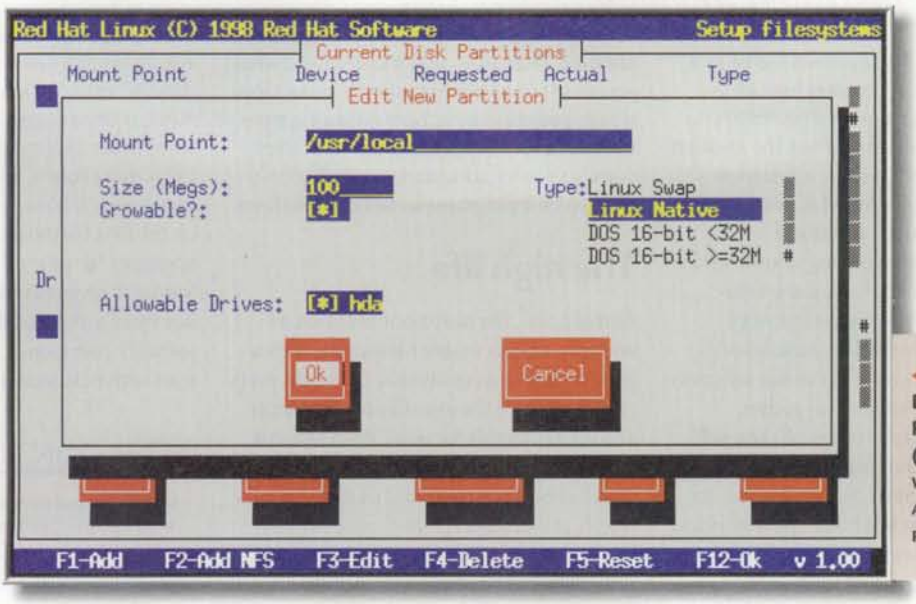
Installing Linux on a standard machine can be too easy to be interesting

(But of course, you did back everything up first, didn't you?)

Disk Druid doesn't offer much in the way of help screens. If you're new to partitioning I strongly recommend spending £35 to get the documented Official RedHat. Even so, Marcus and I poured over the manual for about five minutes before finding what we were looking for: suggestions on how best to use our relatively meagre 500Mb for Linux.

Swap shop

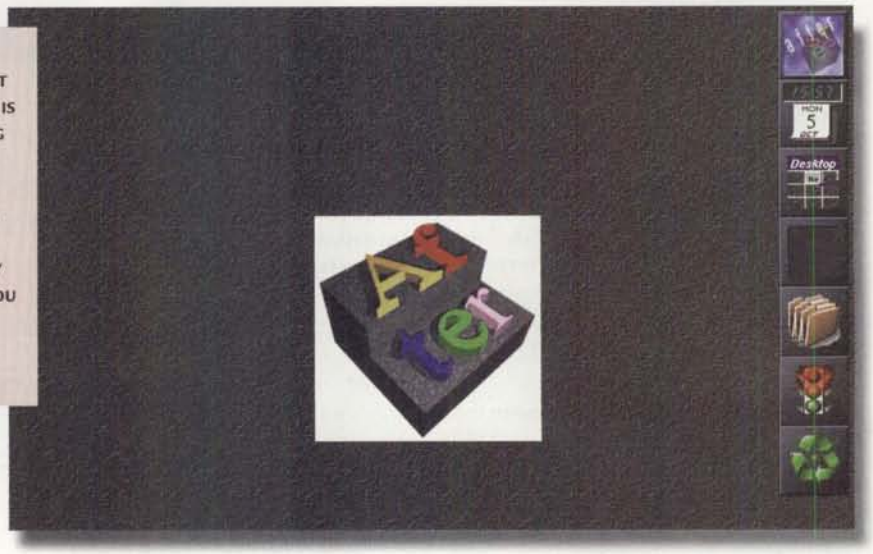
Guided by suggestions on page 26 of the RedHat 5.1 manual we settled for four partitions: a 40Mb swap partition, a 100Mb (growable) root partition, a /home partition of 50Mb, and a 100Mb partition (growable) for /usr. The swap partition [Fig 2] is used for virtual memory (equivalent to Windows' swap file but more efficient), while /home is the directory under which individual users' home directories are stored. So, 50Mb should be fine on a



◂FIG 3 DISK DRUID IS REDHAT'S EASY (WELL, EASIER) WAY OF ALLOCATING PARTITIONS

single-user machine — /usr is, broadly speaking, the location for applications, utilities and libraries associated with the local machine, and the root partition is for general system files and the rest. The thinking behind this way of dividing the disk takes us into intermediate-to-advanced territory which I will not cover here. Until recently I had always just created a root partition and a swap partition, as you might prefer to do. Actually, you don't even need a swap partition: Linux will happily swap to a file in the same way as Windows. But you'll get better performance if you dedicate a partition to swapping. By the way, the "growable" option that Disk Druid offers you for partitions [Fig 3, p243] is not as dynamic as it sounds. If you know IBM's AIX implementation of Unix you might think this means a partition which can get bigger on-the-fly. In the RedHat context it just means that Disk Druid will allocate larger space than you designate if more turns out to be available by the time you've finished your allocation, and before you commit your partition table to disk. We ended up with root and /usr as 214Mb each. Partitioning under Disk Druid may strike the seasoned techie as a little weird because it creates logical partitions by default, even if (as now) you only want to put no more than the allowed four partitions on a drive — a situation where I would recommend sticking with primary partitions. (If you don't understand what I'm talking about, ignore this bit — or, better still, read the Linux Partition HowTo at sunsite.unc.edu/mdw/HOWTO/mini/Partition.html.)

You are then moved on to the selection of a choice of packages — or rather, groups of packages — to install. You will need to transfer the Linux kernel from the CD-ROM to the hard disk, of course, so this and other essentials like the X Window System, which handles the graphical front-end, are already marked for installation.



▸Fig 4 The default AfterStep screen is what we're aiming for with the installation on Marcus' machine. It's austere and simple but totally configurable if you want more bells and whistles

Amongst others, we chose to tick additional boxes for printer support, DOS/Windows connectivity, graphics manipulation, X games, X multimedia support, Print Server, NFS Server, SMB connectivity, anonymous FTP, a web server and more.

Are you still with me? From my email in-tray I know that many readers get confused at this stage about what to install or not to install. It really doesn't matter too much — everything you need to make the system work at the basic level will be installed anyway, and the package installation can easily be changed later. For example, if you're not a programmer you may shy away from the option to install the C and C++ development system and libraries. That's OK, as it's easy to add what you need later. When you get to know Linux better, you may want them on your system, because a lot of applications and utilities come as source code and you really don't need to be a programmer to compile them.

Everything you need to make the system work at the basic level will be installed anyway...

The high life

At this point, the partitions are created and turned into usable filesystems with a high-level format utility that Unix calls mkfs (don't worry — the installation procedure automates all this for you). With Marcus' machine this took about five minutes. The install procedure then told us that 276Mb-worth of packages needed installing and began the job, displaying the estimated time to install everything as soon as the system got familiar with the speed at which things were moving (7mins 45secs). So, pleased with our work so far, we decided to reward ourselves with a coffee break. But then — uh-oh...

The screen read: "RPM install of tix failed: unpacking of archive failed on file /usr/lib/tix4.1/ListNBk.tcl". Several other failure messages followed. The installation was becoming horribly unravelled. RPM is the RedHat package manager, a Linux standard for application installation and removal, and the RPM packages were failing to unpack on the /usr partition. We both spotted the reason at the same time: at 214Mb, we'd made the /usr partition too small and had run out of space.

Fancy that

We were going to have to start the installation all over again. We had two choices: either be less ambitious about the number of packages we installed, or find some more disk space. We decided to give Linux more room, and this meant downsizing the existing Windows partition on the first hard disk. There are some fancy packages for doing this (see the Partition Manager review in *Hands On Unix*, p272). But there's also good-old fips, the free software partitioner, so fips is what we'll start with next month.

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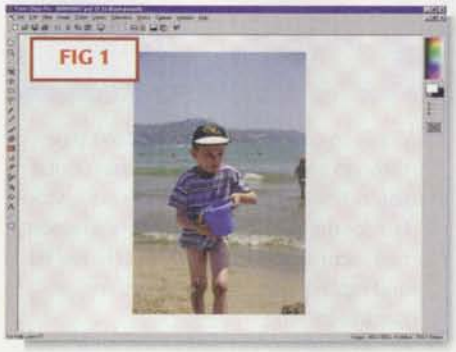
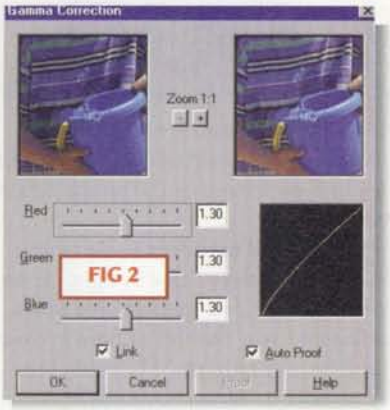
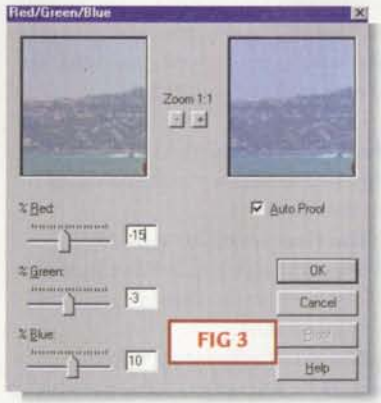
Picture perfect

With some simple retouching, your photos could really sparkle. Ken McMahon shows you how.

There can be few things as disappointing as getting sub-standard pictures back from the photo processors. Dull interior shots, demonic red-eye poses, fingers over the lens and lampposts sticking out of people's heads all combine to put a dampener on the excitement of seeing your photos for the first time. But now, thanks to digital image editing, such blemishes can be banished forever. Whether you use a digital camera or get your images digitised by a photoprocessor, or scan them in yourself, get into the habit of giving them a makeover in an editing application before filing them in an album or printing them out. In this workshop, we'll show you how to "clean up" your pictures by selective cropping and sharpening, improving the colour balance and making the colours more vivid. We'll also look at some retouching techniques and special effects.







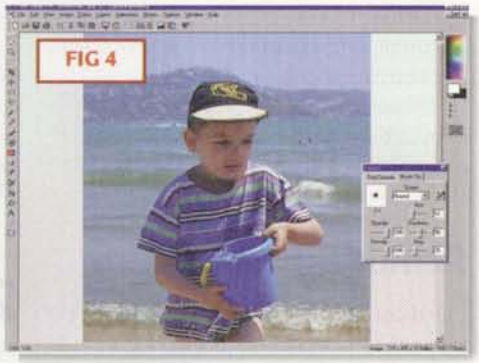


Image enhancement

Here's a typical holiday snap which will benefit handsomely from a little digital manipulation [Figs 1-4].

The first thing to consider with almost any picture is whether it wouldn't look better if there were a little less of it. The answer is nearly always "yes", so get cracking with that cropping tool. It's always best to make cropping the first operation because it makes your image smaller, and with fewer pixels to process, everything will move along much more quickly.

Next, we need to pay some attention to the brightness and contrast while avoiding those particular controls if possible: they can be crude, and can sometimes introduce new problems while correcting existing ones. Most packages provide a means of adjusting the overall tonal curve of an image. Some, like PaintShop Pro, call it Gamma. Photoshop users make this adjustment using the Curves command.

The shadows are represented by the bottom-left portion of the curve, moving through the mid-tones in the middle, to the highlights at the top right. By adjusting the shape of the curve it's possible to make changes in, say, the shadows and mid-tones without affecting the highlights – which is exactly what we want to do here.

Make sure the link box is checked, so the gamma of all three channels – red, blue and green – is changed simultaneously by the same amount [Fig 2]. Moving the slider right, to 1.3, bends the curve upwards slightly. By checking the autoproof box, you can get a live preview of the result in the image window, or you can refer to the before-and-after thumbnails.

Notice how the sea looks an unpleasant shade of green and the sky looks washed out [Fig 1]? Well, I can assure you it wasn't like that on the day, so let's attempt to restore some of the colour.

1 First, we need to select the sea and sky [Fig 3]. It won't hurt to include those background hills because a blue tinge will look like the natural effect of haze. Use the magic wand tool and shift-click to select as much as you can. You can also use modify and grow (or similar) from the Selections menu, but this doesn't always work out as expected.

2 Now pick up any stray areas by using the marquee tool on the freehand setting.

3 Select Colors-Adjust-red/green/blue, or just press Shift-U. Once again, this is one of those visual "er... that looks about right" kind of adjustments. I've got the sea and sky looking the way I want them by subtracting red and adding blue.

The only steadfast rule about colour adjustments is that you generally need to make very small changes if you want to keep things looking natural.

Now, we're going to remove those distracting swimmers in the background by using the clone tool.

1 Select the clone tool, and in the control palette select Aligned mode and no paper.

2 In the brush-tip tab, select a suitably-sized brush with a slightly soft edge [Fig 4]. The other settings

FIG 5

FIG 6

FIG 7

(opacity, hardness, density and step) will depend on what you're cloning, but for this job, leave them all on the default settings.

3 You need to select a source area from which to clone by right-clicking on the image (I selected an area of sea, adjacent to the bathers). Zoom in close, and if you're retouching to a new layer remember to select the source from the original layer then switch to your retouching layer to clone. As the bathers are small, one dab of the brush is enough to obliterate them.

When cloning larger areas use small dabs to build up the cloned area and pick a source area that blends in with the new surroundings.

Removing red-eye

Can there be any photographer who hasn't suffered from the red-eye plague? Fig 5 shows what it looks like: it is caused by the flash reflecting from your subject's retina. There are two ways to eliminate it. One option is to buy a camera with a specially-adapted flash, which flashes rapidly a few times before the picture is taken. Apart from being hugely irritating and a little uncomfortable, the strobe effect causes the pupils to contract so the light can't pass through and bounce back so easily. But if you're reading this, the chances are it's too late for this remedy so you'll have to resort to a second option; editing out the red bits and replacing them with something more natural-looking.

As a precaution, before you start retouching it's a good idea to create a new layer. Then, if anything goes wrong it's often easier to put right. At worst, you can delete the entire layer and start again.

To do this, press Ctrl-A to select all, copy. Then select paste as the new layer from the Edit menu.

1 The first step is to select the offending redness. In PaintShop Pro 5 this is most easily achieved using the magic wand tool.

2 Zoom in (by pressing + on the numeric keypad) as far as possible so you can see what you're doing. The pupil won't be that big so you will need to go in a long way.

3 With the magic wand tool selected, set the tolerance in the control palette to around 30. If you can't see the control palette, select Toolbars from the View menu and check the control palette box.

FIG 8

4 Click on the centre of the red pupil area and the magic wand will do the rest, selecting only the red pixels [Fig6]. If you didn't get them all, just continue to Shift-click with the magic wand, although you may need to reduce the tolerance to avoid picking up stray pixels at the edge. Do the same for the other eye, again holding down the Shift key to add to the selection.

5 Select Colorize from the Colours menu and drag the saturation slider to zero. This takes all the red colour out of the pupils, leaving grey pixels [Fig 7].

Should we be putting colour into the pupils rather than taking it out? No, we shouldn't. Your pupils are not coloured, they're black – it's the iris *surrounding* the pupil that is the coloured part and we are

Ten tips for better pix

1 Do experiment – you can always Undo. If your application doesn't support multiple Undo, save first, then revert if it doesn't work out. Or, try again in a new layer.

2 Add plug-in filters to extend your application's range of effects.

3 Consider cropping before you do anything else. It will probably result in a better composition and it will speed-up editing.

4 If your application is responding too slowly, add more RAM or free-up space on your hard drive and run a disc optimisation program.

5 Install colour management software, so what you print more closely resembles what you see on-screen.

6 Make sure your monitor is properly adjusted before you start. Advice is available from www.csf.org.

7 Experiment with different papers and make sure your printer driver is correctly configured for them.

8 If you have to clean up a lot of images, consider automating the process using Extensis Intellihance (see *Hands On Graphics & DTP*, p288)

9 If your application supports layers, use them. They make undoing your mistakes a lot easier.

10 Save frequently, then if you really make a mess of things you won't have lost everything.

going to deal with that next. Unless your shot is a tight close-up it is unlikely that you will actually be able to see the iris, which is the part surrounding the pupil that has colour and texture (a bit like the inside of a glass marble). So, we are going to make a selection of a ring around the pupils where the iris would be.

1 Use the magic wand tool as before to select the entire central grey area of the eyes.

2 Then select the rectangle marquee tool and select Circle from the pull-down menu in the tool controls tab of the control palette.

3 Holding down the Ctrl key to subtract from the existing selection, draw a small circle in the centre of each eye. Once again select Colourize from the Colours menu and adjust the hue and saturation sliders [Fig 8] until the colour of the eyes looks about right. I've chosen a striking blue which matches our subject's dressing gown quite nicely.

Incidentally, if you do as I suggest and perform all your retouching on a new layer, you will be able to use Paint Shop Pro's Animation Shop to make a two-frame animated gif with flashing demonic eyes!

Special effects

Some of the better home darkroom packages (for instance, PhotoDeluxe 2, Livepix 2 and Professor Franklin's Instant Photo Effects) provide custom filters or walk-throughs for creating effects such as duotones, adding frames, or producing an antique photo effect. If your image editor does not provide such filters, you can easily create these effects yourself; and even if you do have a one-step filter, it is more fun this way and you have more control over the result.

We are going to produce an antique effect by sepia-toning a colour picture, adding grain, producing a patchy, fading, effect and finally creating an oval vignette of the kind popular with Victorian portrait photographers.

First, we will add the grainy effect, because if we do not do this at the beginning it will produce some unwanted colour in the final image. Fig 9 shows our not-very-old-looking original with the grain already added. To do this, simply select image-noise-add and add around 20 percent with the uniform button checked.

Now we need to lose all the colour. Convert the image to a greyscale by selecting Greyscale from the Colour menu. Then convert it back to RGB by selecting — again from the Colour menu — Increase Colour Depth-24bit. This will not bring all your colours back, but it will make it possible to tint the picture any colour you like, which is what we are going to do next.

FIG 9

FIG 10

FIG 11

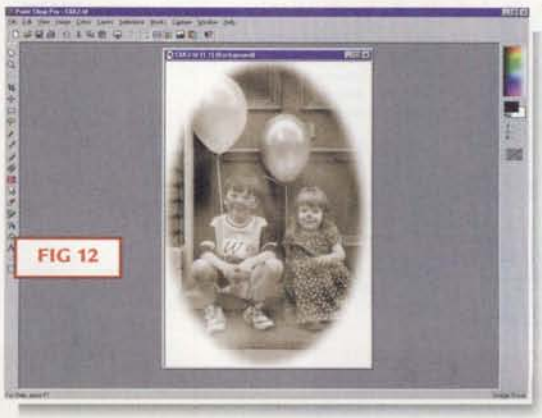


FIG 12

In the bad old days, to get an effect like this you had to put up with chemicals which stank of rotten eggs — but not now! Select the Colourize palette once again and adjust the hue and saturation sliders until you achieve a rich brown tint [Fig 10]. You may need to lighten things up a little at this stage using the gamma control — nearly there. Now, we're going to help give the illusion of age by simulating fading, so it's time to get acquainted with the retouch tool. This offers a whole box of retouching tricks including dodge, burn, darken, lighten, soften, sharpen and even the astoundingly-named "hue up". The most effective tools for ageing are Dodge and Burn which you can use to selectively lighten and darken parts of the image. The key to the retouch tool is to find the right combination of brush settings [Fig 11] so you should experiment with brush size, shape, hardness and opacity to achieve the best effect.

All that remains now is to add the vignette [Fig 12].

1 Select the rectangle marquee and change the selection type to Ellipse in the controls palette.

2 Enter a feather value of around 20 (the higher the value, the softer the edge) and draw an oval around the central picture area, stopping just short of the edges.

3 Press Shift-Ctrl-I to invert the selection, then hit the delete key. I've used the Soften filter to take off the hard edges and re-applied Colourize to put back some of the sepia lost through over-zealous use of the retouch tool.

The antique picture show

All the examples here have been produced in Paint Shop Pro but you can reproduce them using virtually any package on the market. If you cannot find a particular tool or menu command, look for another way to achieve the same effect. For example, you may need to use an airbrush, or a smudge tool to produce antique fading effects. Some packages even have burnt-edge filters which you can use for this sort of thing. Have a good look through your toolbox and effects filters and experiment with different ways of achieving the same thing.

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Culture club

Being a newcomer to the net is awkward enough without having to suffer the slings and arrows of snobbery. 'Internet elite, your time is up' says Nigel Whitfield. And, a basic guide to forms.

How long have you been using the internet? Chances are that many people who read this column have come to it fairly recently. It was, after all, only in 1994 that Demon Internet launched, providing low-cost access for many users. Prior to that, people who used the net tended to be in universities or networking companies and although access in the US was more widespread, it was still very much a tool for the educated elite. Much of that changed when AOL, still the world's largest online service, gave its users access to the net.

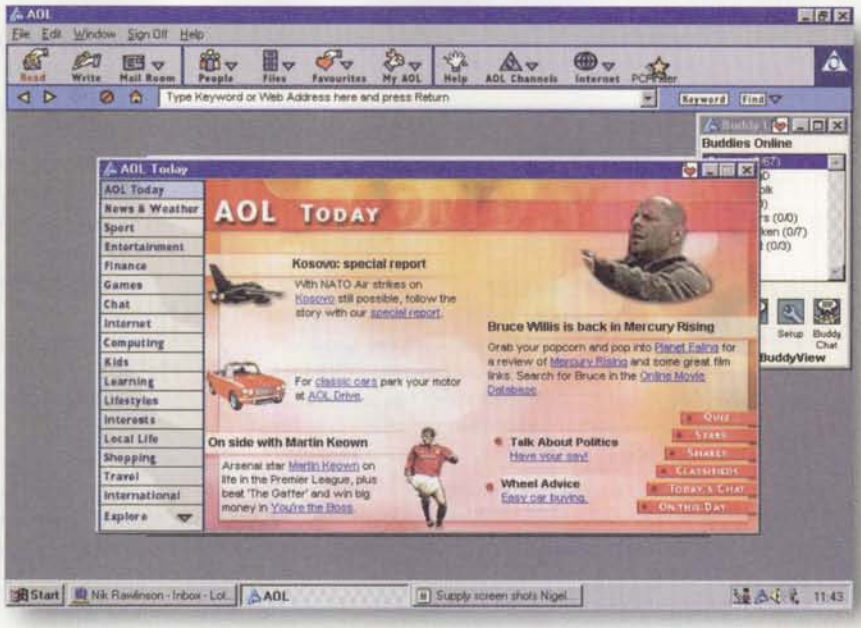
Paradise for some

Culture clash is just one phrase to describe the result. Yes, of course there were teething troubles: you'd expect little else when a culture that has developed over years suddenly meets a newer one, with different conventions. Of course, not everyone thought it was a good idea. Many of those who'd waxed lyrical about utopian ideas of cyberspace suddenly revealed that what they really meant was a utopia that didn't include the ordinary people who paid for access via systems like AOL. Some of this was doubtless due to the stupid doings of some AOL users, but it's a fact of life that if you have a service that anyone can join, a proportion of users will be daft (unlike a university, for instance). What is amazing to see, however, is that despite the passage of time and the work that people like AOL have put into educating their users, the old attitudes persist. Lurk around in most newsgroups or discussion forums and you'll still see sarcastic or abusive comments about people who use particular service providers, or who are simply newcomers to the net. It was unpalatable enough when the real, old-time internet users started doing it, trying to keep their utopia as exclusive as Aldous Huxley's; and it's no less so when people who are relative newcomers themselves do it.

There were once people who thought you didn't deserve to have access to the net

The point of the history lesson? There's no doubt that the internet can be a useful tool, and the current crop of dialup services have done a lot to make it more accessible. Yet next time you're sitting there thinking "It's only £10 a month", remember that there are many people for whom "only" and "£10" are not often used together. Many of those will undoubtedly be tempted to try out the net through the latest crop of inducements, including those from BT and Cable & Wireless which promise a rate of around a penny a minute on top of the cost of the phone call, or the completely free Dixon's Freeserve.

Whether or not those cheap services pose a real threat to the established players is something time will tell. But what's already apparent is the extent to which a number of ordinary net users don't like it, judging by the protestations in some newsgroups. And, it doesn't take much to imagine that many users will readily tar all those with a Freeserve address or a BT Click email account in the same way as they've done to AOL users in the past.



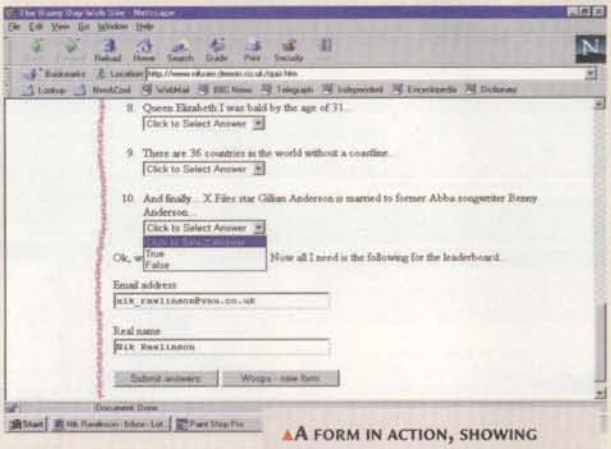
▲ AS TIME GOES ON, THE OLD PRECONCEPTIONS ABOUT AOL USERS ARE THANKFULLY STARTING TO WANE

Available to all

Before you join the bandwagon and rush, sneering, to point out the spelling mistakes of "people who can't even afford a decent ISP", stop and think. What do you want the internet to be? Should it be a resource for all, welcoming people for what they say rather than criticising them for where they post from, or would you rather cast your vote with some of the old-timers.

There will certainly be turbulent times ahead as the market reacts to cheap or free inducements, but it's best to wait and see what happens rather than proclaiming that "Dixons must not be allowed to get away with it", as some have already done. In the rush to judge, it may pay to remember that there were once people who thought you didn't *deserve* to have access to the net.

FORMS: A BASIC GUIDE



▲A FORM IN ACTION, SHOWING DROP-DOWN MENUS, TEXT BOXES AND BUTTONS FOR SUBMITTING AND RESETTING THE PAGE

If you want to use forms, you need to understand a little about how HTML tags work. There are many good sites, and a previous article I wrote for *PCW* is on the web at www.stonewall.demon.co.uk/tutor/html which, while not very up to date, will explain the basics.

An HTML form is made up of HTML code between a <FORM> and a </FORM> tag. You can use any code within it, and each field is created with the <INPUT> tag. One of the biggest problems is that people do not correctly specify what they want to happen in the <FORM> tag. This should look like:

```
<FORM METHOD="POST" ACTION="somescript">
```

The "method" tells the browser how to send information. Use POST whenever you can. The alternative is GET, but there is a limit to how much information can be sent and it varies from system to system (it could be as little as 256 characters).

The POST action specifies the name of a script or program that will be run on the web server when the form is submitted, and this is where most people go wrong. Only a few browsers allow you to put mailto:me@myaddress.com as the action. You need to find out from your provider what scripts are supported as it will often have some for common tasks like sending mail. Don't assume that because your web design program has filled in the name of a script for the action, it's correct. It's more likely not to be. If you haven't written and uploaded a script, or your provider has not said it has one, then it won't be there.

Each field on your form is defined by an INPUT tag. For example:

```
<INPUT TYPE="TEXT" NAME="username">
```

A field could be TEXT, or PASSWORD, or CHECKBOX. You can also put VALUE="default text" to fill in a field with information that can be typed over, or to say what value should be assigned when a box is checked. NAME is the name of the variable to which you can refer in your script. Some, such as mail scripts written by your provider, will need specific variables named for things like the destination address and subject of the mail; these are often fields with the type set to "HIDDEN", which means they're not displayed on the page.

Adding "radio buttons" is easy. Where only one of a series of choices can be selected, you simply use the same NAME for each one, like this:

```
<INPUT TYPE="radio" NAME="confirm" →
 VALUE="yes" CHECKED>
<INPUT TYPE="radio" NAME="confirm" VALUE="no">
```

There are a few types of field which work differently, though. First is the text area, a box into which you can type information. You add one of these to your page with code like this:

```
<TEXTAREA NAME="comments" ROWS="10" COLS="50">
Enter your comments here
</TEXTAREA>
```

To add a drop-down list to your page, use the SELECT tag:

```
<SELECT NAME="mylist">
<OPTION VALUE="choice1">First entry
<OPTION VALUE="choice2">Second entry
<OPTION VALUE="choice3" SELECTED>Third entry
</SELECT>
```

You don't have to have an option already selected. If you don't, the drop-down list will appear to be blank when the page is first displayed.

Submit and reset are two important types of field. These fields don't need a name: you could just enter

```
<INPUT TYPE="submit"><INPUT TYPE="reset">
```

and they'll work. The submit field creates a button that sends the form back to the web server, while the reset button clears the form as if you'd just loaded the page in your browser. You *must* have a submit button, but you don't *need* a reset one. Specifying a VALUE for either will use the text you give to label the button, so

```
<INPUT TYPE="submit" VALUE="Send in your →
order">
```

would create a button labelled "Send in your order".

A picture can be used instead of a simple button. Most graphical browsers will let you do this. Here's how:

```
<INPUT TYPE="image" SRC="gifs/button.gif">
```

An image used like this is always assumed to be a submit button. The browser will, however, return two extra variables, X and Y, which indicate where in the picture the user clicked, so with a clever script you could use a button bar to select different options.

Remember, you can design the most beautiful form in the world but it will come to nothing if you don't have the action set to a script that's valid on the web server where your form is hosted. Whatever design program you are using, check the code for your forms afterwards, make sure that the action is right, and that all the fields are properly named.

These are the most common problems, and if you crack those, the rest is simple. For a more detailed tutorial on forms, go to www. ncsa.uiuc.edu/SDG/Software/Mosaic/Docs/fill-out-forms/overview.html

[Key: → *code continued as a single line*]

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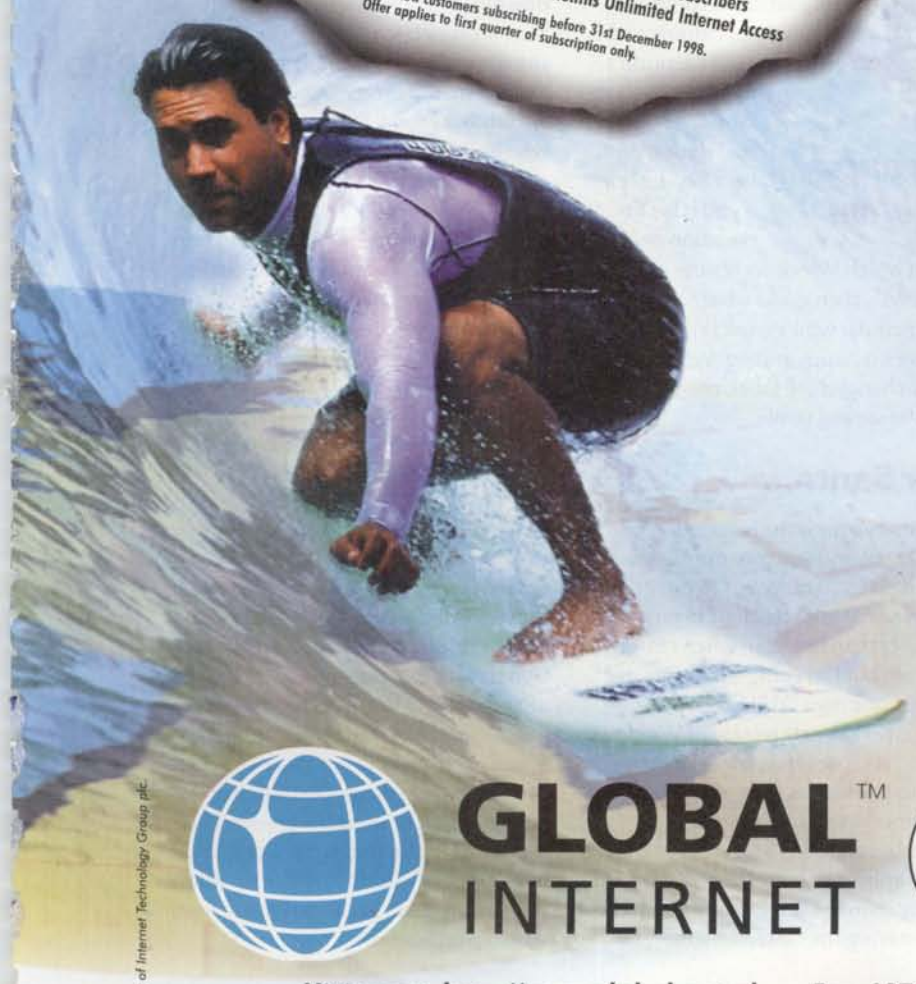

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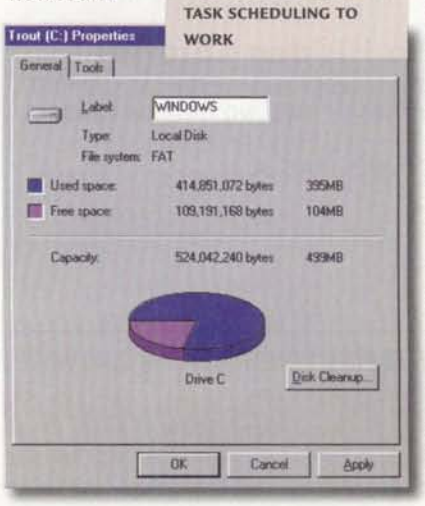
Task master

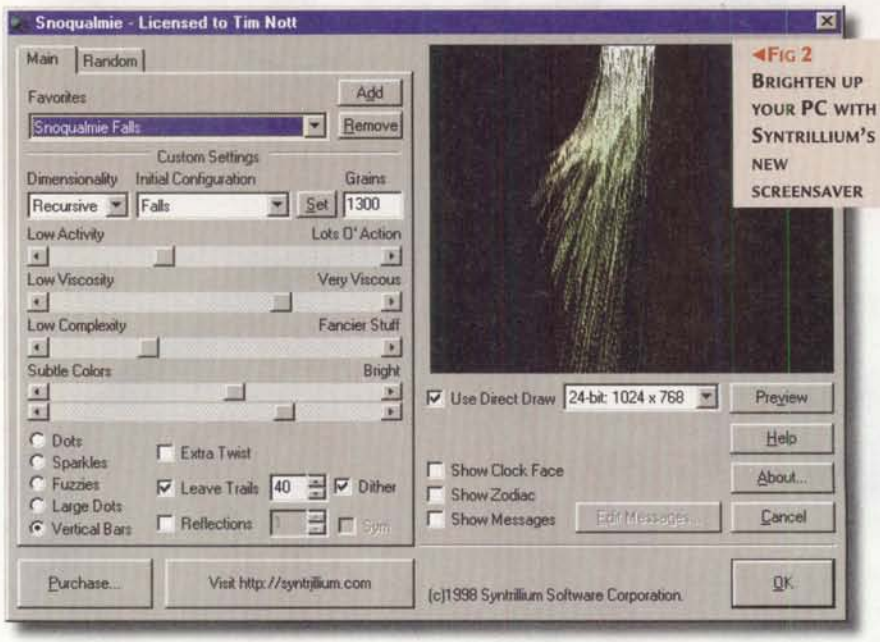
You've loaded up Windows 98 but the Task Scheduler doesn't work — even tech support can't help. Tim Nott has a way to get things moving again. Plus, a 'can't be done' problem is solved.

Andrew Hawkins celebrated the launch of Windows 98 by buying and installing it. And everything went smoothly except that the Task Scheduler wouldn't work. Having drawn a blank at the MS Knowledgebase, he turned to the newsgroups and made the remarkable discovery that not only is there a newsgroup dedicated to the Task Scheduler, but that other members were having the same problem. No solution had been found. So Andrew bit the bullet, wiped the C: drive and did a clean reinstall, but... same problem. He then dipped into his free 90 days' technical support from Microsoft. It gave him lots of helpful tips about altering startup items, none of which helped. So, back to the Task Scheduler newsgroup, and lo, some bright spark had now found the answer. Like many people, Andrew had separate disk partitions (drive letters) for Windows, applications and data (you can give a drive or partition a name, or "volume label", which he had done). And here lies the bug: if you label the partition or drive on which Windows resides as "Windows", then guess what? Yup, the Task Scheduler won't work [Fig 1]. But there's a happy ending. When Andrew changed the label, the Task Scheduler sprang to life.

... he made the remarkable discovery that other newsgroup members had the same problem



▼FIG 1 DON'T DO THIS — NOT IF YOU WANT TASK SCHEDULING TO WORK



◀FIG 2 BRIGHTEN UP YOUR PC WITH SYNTRILLIUM'S NEW SCREENSAVER

Dear Santa...

Traditionally, this is the issue where we *Hands On* columnists write our "Dear Santa" wish list. This year, I'm not going to be greedy. Well, actually, I'm going to be greedier than last year, when I forgot to do it at all, but I'm going to confine my list to just one item I'd like to see addressed in the next release of Windows.

First, Microsoft has made great efforts to protect us from the goblins on the internet. We can filter out "unsuitable content" such as pornography, reject "unsigned" content that may damage our PCs, be warned when entering the "internet zone", be warned when sending information or downloading programs, and so on. In fact, it often becomes impossible to see the screen for the warning messages, and the Internet Explorer Options comprise a wealth of security features, most of which are incomprehensible.

But what of the enemy within? Let's have a better way of protecting family PCs from the ravages of small children than the hideously unfriendly Poledit. Let's have a way of password-protecting drives or folders on family PCs, so that parents can keep their personal and work files out of the reach of children, and elder brothers can keep their collections of "unsuitable content" away from the eyes of younger siblings.

On an equally topical but brighter note, two years ago I wished for a screensaver of a waterfall. Syntrillium, which brought us the very wonderful Windchimes and the equally splendid Cooledit, has come up trumps with Snoqualmie [Fig 2], named after the falls in Washington. This does much more than waterfalls: like all Syntrillium products there's a rich source of displacement activity to be had in configuring it, or using the pre-set schemes which include fountains, fireworks and a huge range of kaleidoscopic or random patterns. You can get a trial version from www.syntrillium.com

Following last month's venture into the impossible, here's another long-standing "can't be done" which has now been solved. This one comes from Deepu Chandy Thomas, a 19-year-old engineering student in India. It is for either Windows 95 or 98 with IE4.

You can give any folder a custom icon and tooltip text. Use Notepad to create a file containing the following, in the desired folder:

```
[.ShellClassInfo]
IconFile=Path to the icon file
InfoTip=Any text you want
```

Save this as DESKTOP.INI, then set the folder's system attribute from a DOS box by navigating to the folder and using the attrib command. For example:

```
CD C:\WINDOWS\DESKTOP
ATTRIB +S MYFOLDER
```

Note that if the path to your folder contains a long folder name, or names with spaces, you need to enclose it in double quotes, for example:

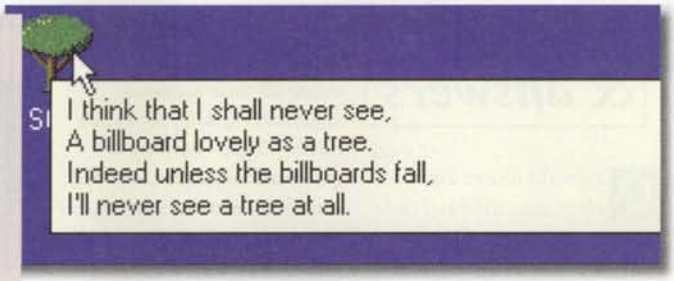
```
CD "C:\WINDOWS\DESKTOP\
MY NEW FOLDER"
```

Switch focus to the folder containing the desired folder (or in this case, the desktop) by clicking on it, then hit F5 to refresh it. You should see the icon change, and hovering the pointer over it will produce a tooltip containing the chosen text [Fig 3]. But things get more complicated if you want to pick an icon from a file containing several, as I found out after a glorious time-wasting afternoon.

First you have to catch the icon number. You can do this by creating a shortcut (to anything) and then right-clicking it, Properties, Change Icon. Hit the browse button and select the file from which you want to extract the icon: in the example [Fig 4] it's SHELL32.DLL which contains 80 icons. They are numbered, starting at 0 and working down, then across, so that the tree icon is number 41. Then change the desktop.ini file to read as shown in Fig 5. You might find that the icon does not change, even having refreshed the desktop several times. If this is the case, use the Tweakui "Repair Icons" tool, or go to Display Properties, Appearance and change the icon size by a few pixels. Hit the Apply button, then change the size back and OK out.

[FIG 5]

```
[.ShellClassInfo]
IconFile=c:\windows\system\shell32.dll
IconIndex=41
InfoTip = Your text here
```



▶FIG 3 CUSTOMISE FOLDER ICONS AND TOOLTIPS WITH A DESKTOP.INI FILE...

▲FIG 4 ...BUT FIRST CATCH YOUR ICON

Here's a quick addition to the long-running "Shutdown blues" saga, where the PC never gets beyond the "Please wait..." screen. Mark Lomas suffered this problem and cured it by using the Windows 98 System Configuration utility mentioned in the October *Hands On Windows* column. You can get at this from Start, Programs, Accessories, System Tools, System Information and then go to the Tools menu, although it is probably quicker to Start, Run... MSCONFIG. On the General tab, click the Advanced button and you will find a checkbox to Disable Fast Shutdown. Mark did so, and his problem disappeared.

... the pre-set schemes include fountains, fireworks and a huge range of random patterns

Here's a funny thing. Robert Trzebiatowski found that some of his Start Menus were too long to fit the screen and showed little scroll arrows at the top and bottom. Well, that's a "feature" of Windows 98; on 95, the menu used to break into multiple panels. I get around it by organising my menus so that no single level is too long for the screen. However, when Robert tried this, the menus shrank but the arrows stayed put, and with only one item on a menu, the arrows obscure it. I can't reproduce this, because the arrows go away politely on my PC. So, has anyone else experienced this, or better still, found a cure?

QUICKIES

To select all but a few files in a folder or Find results, first select the ones you don't want, then Edit, Invert selection.

When modifying an item (such as the Active Title bar) in Display Properties, Appearance, clicking on it in the picture is quicker than scrolling down the list.

Questions & answers

Q I would like to archive large quantities of data from a server onto CD-R and wish to do this on a time basis (e.g. all files prior to 31st December 1995). Find file on Windows 95 and NT allows the files to be selected but loses the directory structure, which I need to make sense of the data copied to CD. Is there a method or utility available which will allow me to carry out this process?

TONY DAWSON

A *You can manage this with DOS XCOPY, Windows Find, some spare disk space and a little ingenuity. Let's take an example. Say I want to copy all the files in my Hands On 95 folder and subfolders modified between 25/09/96 and 24/09/97. First, I create a temporary store for the files at F:\TEMP. Then I open a DOS box and type:*

xcopy "e:\words\pcw\Hands On 95" f:\temp /D:25/09/1996 /s

The quotes are needed because of the long folder name. The date form must match that shown on the screen when you type DATE from DOS, and the /s switch copies subdirectories and their contents. The snag is that the date filter only works one way (i.e. it selects files modified on or since the date given) so my next step is to run a Windows Find on F:\TEMP to get all the files modified between 25/09/1997 and the present, with "Search subfolders" ticked. Now I have to be a little careful, as the copied subfolders, unlike the files therein, will bear the current date and if I delete those I'll delete all their contents regardless of date. So, I click on the "Type" heading to group all the folders together and then delete everything but those folders (see "Quickies", p255), leaving just the new folders and any files they contain dated before 25/09/97, ready to be transferred.

You can find out more about the XCOPY command by typing HELP XCOPY from the DOS prompt. If you haven't got the DOS help files installed, you'll find them in the OLDMSDOS folder on the CD-ROM (HELP.COM and HELP.HLP). With Windows 98 you may also need to copy the XCOPY.files (XCOPY.EXE, XCOPY32 .EXE and XCOPY.MOD) to the WINDOWS\COMMAND folder.

Q On my computer and on my dad's laptop, the time is displayed in 24-hour format. On my mate's PC, his clock is 12-hour and has PM after it. I cannot find anything about it in Windows Help, the time settings in Control Panel or even the registry.

GRAHAM (SURNAME NOT SUPPLIED)

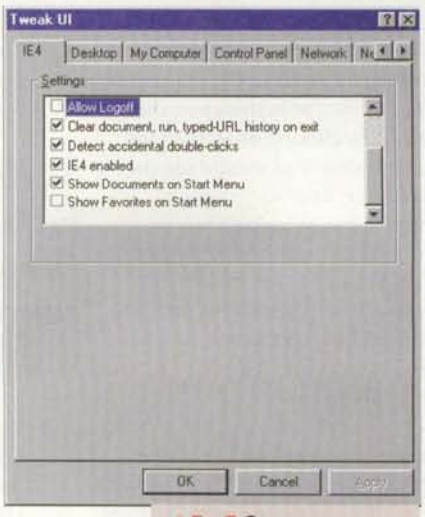
A *It is in Control Panel, but under Regional Settings rather than Date/Time, where one might expect. You need to go to the Time tab and look in the Time Style box where you'll see something like hh:mm:ss tt. You can choose a different format from the drop list, or have more fun typing in your own [Fig 6], doing excitingly futile things such as putting the minutes before the hour. The salient points are as follows. Upper or lower-case H switches between 24- and 12-hour formats, and a double letter forces a leading zero. The tt suffix appends AM/PM, but you can change these as well in the boxes below. Unfortunately, you only get eight letters, which rather stymied my intention to have "Far too early to get up" and "Time for a siesta" on the system tray clock. Similar tricks apply to the Date tab: d and dd give the day number, with or without a leading zero, while ddd and dddd give the short or full weekday name. One to four Ms work similarly for the month, and two or four Ys give the long or short year. Keeping the best for last, you can add text anywhere in the date or time by enclosing it in single quotes, but beware that more than a few characters kills the system tray clock. These settings affect not just the clock, but the way dates appear in Explorer and in applications.*

▲ FIG 6 HOURS OF FUN CUSTOMISING THE TIME AND DATE

Q I have recently upgraded to Windows 98 and have succeeded in removing most of the desktop enhancements because I do not like the new look. But two items remain: on my Start menu, there is a rather nasty "Log Off USER", and also the "Favorites" folder. Can I get rid of these? Especially the Log Off one because I do not have multiple users installed.

TOM GREK

A *Yes, you can kill both of these from the IE4 tab of TweakUI [Fig 7] which now comes with Windows 98. If you have not yet installed it, you will find it in the Tools\Reskit\Powertoys folder on the Windows 98 CD. Open the readme.txt file in Notepad for details of how to install TweakUI.*



▲ FIG 7 GETTING RID OF THOSE UNWANTED START MENU ITEMS

PCW CONTACTS

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Putting the boot in

With a dual boot system, you can easily switch between operating systems. Roger Gann shows you how to do it in Windows 9x.

Windows 9x introduced the concept of dual booting. This lets you choose, at boot time, which operating system you wish to load; normally the choice is between Windows 9x and an earlier version of MS-DOS. The dual boot option is automatically installed if you upgrade to Windows 9x and you choose to install the new Windows in a directory other than that where the old version resides.

Here's an example. Windows 3.1x is installed in C:\Windows and you opt to install Windows 9x in C:\Win9x. This is not the default option so it involves extra hassle; you'll have to reinstall all your old applications, as they won't automatically be upgraded to Windows 9x.

So why would you want to retain that old clunker, MS-DOS? A number of reasons spring to mind, but the main one would be to play old DOS games like Myst or Seventh Guest. Games developers are notorious for taking outrageous liberties with their coding in order to squeeze every last drop of speed from a PC, and old games just don't run well on a multitasking operating system like Windows 9x. They know nothing of peaceful co-existence with other programs and expect to have the run of the place — that is, have exclusive access to all your hardware. I think the best way to do this is to run them from MS-DOS. OK, you could create a boot floppy, but where's the fun in that? A much more elegant solution is to dual boot from your hard disk.

USING MS-DOS TO RESTORE DUAL-BOOT CAPABILITY TO WINDOWS 95

With dual boot installed, there are two ways to select the old operating system to load. At boot time, if you press F8 when you see "Loading Windows 95" or hit the Control key when you see the Windows 98 splash screen, you'll see a menu of options, one of which is "load previous operating system". Or, instead of hitting F8, you simply hit F4 to directly load the old OS.

One link that Windows 9x keeps with the dark past is that it uses the same or similar filenames for its system and startup files. With dual boot, this would ordinarily mean that you'd wind up with two sets of almost identically named files in the root directory of your boot drive — an impossible situation. Windows 9x gets around this by dynamically renaming these files, depending on what operating system you choose to boot with. During Setup, Windows 95 preserves the following MS-DOS files by renaming them [Fig 1]. When you press F4 at system startup and select Previous Operating System to start MS-DOS, these files [Fig 1] are renamed as their original MS-DOS filenames and the Windows 95 version files are renamed as shown in Fig 2.

[FIG 1]

Original MS-DOS filename	Renamed file
COMMAND.COM	COMMAND.DOS
CONFIG.SYS	CONFIG.DOS
AUTOEXEC.BAT	AUTOEXEC.DOS

[FIG 2]

Windows 95 filename	Renamed file
COMMAND.COM	COMMAND.W40
CONFIG.SYS	CONFIG.W40
AUTOEXEC.BAT	AUTOEXEC.W40

How to add dual boot

What if you want to add dual boot at a later stage? Maybe you've gone and done what most people do when they install Windows 95 and accepted the defaults and installed it over Windows 3.1x, thus losing the dual boot option? Or maybe you've bought a new PC with Windows 9x cleanly installed on it. This isn't the end of the dual boot issue: it is possible to manually reinstate this useful feature. Bear in mind that *Ye Olde* MS-DOS cannot see partitions larger than 2.1Gb, so dual boot isn't going to work on multigigabyte FAT32 drives.

Here's how to restore the dual-boot capability when Windows 95 was installed without this capability having been configured. The easiest way is if you upgraded an existing DOS/Windows 3.1 installation. In this latter case, we have a head start because as we've already seen, Windows 95 leaves the old DOS system files in place but renamed.

1 **Using a text editor** add a line to the [Options] section of the MSDOS.SYS file.

2 **This is a protected** system file so right-click it, select Properties and uncheck the Read Only box first. Then add this line to it:

```
BOOTMULTI=1
```

3 **Save the file** and don't forget to restore the file's Read Only status.

4 **Reboot** — and this time when you press F8 you'll see an extra entry on the Boot menu, "Previous version of MS-DOS". See p258 for details of how to edit this file.

If there is no "previous operating system", it's not quite as easy. First you have to find a bootable system floppy disk that has MS-DOS 5.0 or better. Remove the system attributes from its system files, IO.SYS and MSDOS.SYS, otherwise you won't be able to perform this trick. This is done with the ATTRIB utility (you'll find it in the \Windows\

Command folder). The files in question will be marked with the Hidden, System, and Read Only attributes, so to clear them from IO.SYS you'd type:

```
ATTRIB -H -S -R IO.SYS
```

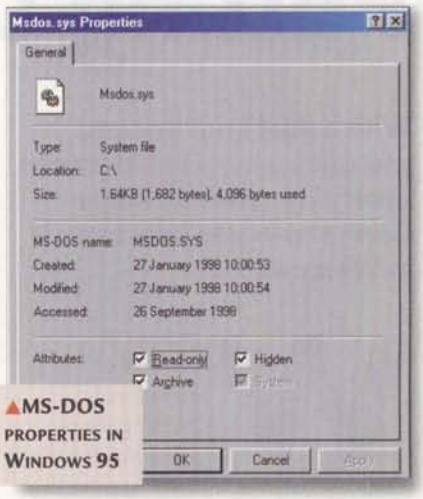
Having done this, you can rename the IO.SYS and MSDOS.SYS files on the floppy to IO.DOS and MSDOS.DOS.

ALLOWED ENTRIES IN MSDOS.SYS

Windows 95 Setup creates a hidden, Read Only system file in the root of the computer's boot drive, named MSDOS.SYS. Confusingly, this is the same name as the key MS-DOS system file but that was a binary, program file, not a text file as is the Windows 95 MSDOS.SYS. If anything, MSDOS.SYS is more related to another Startup file of yore, C.SYS. The [Options] section allows you to tailor the startup process to your specific needs.

Here's a list of some of the allowed entries in MSDOS.SYS. The default value for each of the above options is 1 – that is, enabled. So set the entry to 0 to disable it.

Entry	Description
BootGUI=0	Disables the automatic graphical startup. This has an effect similar to adding shell=/D /K autoexec.bat to CONFIG.SYS, and is easier to use.
BootKeys=0	This prevents any of the special startup option keys (that is, F5, F6, and F8) from functioning. Use this setting to prevent users "tinkering".
BootMenu=1	Displays the Windows Startup menu by default, eliminating the need to press F8 to see the menu.
BootMenuDefault=#	Sets the default menu item on the Windows Startup menu; the default is 1 or 4, as appropriate.
BootMenuDelay=#	Sets the number of seconds to display the Windows Startup menu before running the default menu item.
BootMulti=0	Disables dual-boot capabilities (for example, the ability to start MS-DOS by pressing F4).
BootWin=0	Disables Windows 9x as the default operating system; useful only with a version of MS-DOS 5 or 6.x on the computer – similar to pressing F4 at system startup.
LoadTop=0	Specifies not to load COMMAND.COM or DRVSPACE.BIN at the top of conventional memory. Set to 0 if you have compatibility problems with some DOS software.
Logo=0	Prevents the animated logo from being displayed and, as a consequence, avoids hooking a variety of interrupts that can create incompatibilities with certain third-party memory managers. You can also temporarily kill the "clouds" splash screen by hitting the ESC key.



▲**MS-DOS PROPERTIES IN WINDOWS 95**

1 Copy both files to the root directory of your boot drive (usually drive C). There are no restrictions on where these files should be placed as long as they are from MS-DOS version 5.0 or later.

2 If you're using disk compression software such as DoubleSpace or Stacker, don't forget to copy IO.DOS, MSDOS.DOS, COMMAND.DOS, CONFIG.DOS and AUTOEXEC.BAT to your host drive, as well. Do the renaming before copying the files across to the hard disk, otherwise you'll overwrite the Windows 95 versions of these files.

3 Copy the COMMAND.COM file from the MS-DOS floppy disk to the root directory of your boot drive (usually drive C) and rename it COMMAND.DOS. Do it in one go, thus (*all on one line*):

```
COPY A:\COMMAND.COM C:\
COMMAND.DOS
```

4 Create CONFIG.DOS and AUTOEXEC.DOS files which are appropriate for the MS-DOS version you are using. You can start by looking at your old CONFIG.SYS and AUTOEXEC.BAT files and renaming them. For gaming, make sure that you have your real mode drivers for the CD-ROM and sound card loaded. Also, check that MSDOS.SYS has the required MultiBoot=1 entry and if it hasn't, add it.

Dual boot is now restored and you can start the computer using Windows 9x or the earlier version of MS-DOS.

PCW CONTACTS

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What a performance

Andrew Ward wonders whether NT's new routing capabilities can cut the mustard.

In the old days, when networks were simply there to save having to walk from one machine to another with a floppy disk, it was common to route between two IP networks using any old 286-based DOS machine, a couple of obsolete 8-bit network cards and freely-available routing software. Now, network performance is more critical than the speed of individual desktop systems and extremely high-performance dedicated network devices are essential for routing, bridging and switching functions.

Microsoft, however, would have us believe otherwise and continues to enhance the routing capabilities of Windows NT in the expectation that we will start to use NT machines instead of dedicated routers. But I've had so much trouble with NT's operation in a routed IP environment recently that I'm doubtful of its true abilities in this area.

Specifically, I have continual trouble with the NT machines on this network producing some sort of IP traffic that makes an off-network access, causing the ISDN router (which is not an NT box) to dial my ISP. It's long been necessary for manufacturers of such devices to have to ignore much of the network traffic generated in ever increasing volumes by each new version of network operating systems, but Microsoft and other PC software vendors appear to be able to continually outwit them.

I spotted long ago that the Remote Access Autodial Manager service causes a spurious access each time a user logs on, but that's easily solved by disabling the service (or rather, changing the startup mode from Automatic to Manual) within the Services control panel. The trouble is, I did that some time ago, and when the installation of Windows CE Services reinstalled RAS the other day, the service was of course re-enabled. I chose the same day to install the Freeserve Internet software on another system, which also causes an RAS installation. Coincidentally, another user installed RealNetworks' RealPlayer on yet a third machine on the network — and this causes 12 spurious network accesses an hour. It took several hours of head-scratching and network monitoring to eliminate all these separate causes, after swelling BT's coffers considerably.

If you have a similar configuration, don't use RealPlayer at all (Microsoft has now released the Windows Media Player for Windows NT which will handle most multimedia data types you're likely to

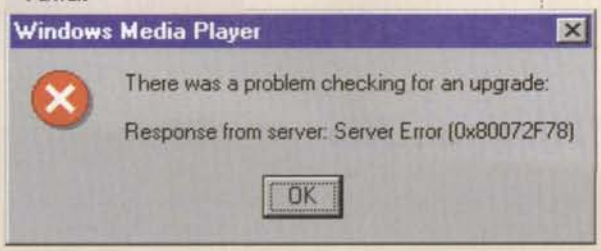
NETWORK SOUND AND VISION

The new Windows Media Player for Windows NT 4.0 supports a huge range of different media types, including Windows Media formats (formerly known as NetShow), RealNetworks RealAudio and RealVideo (version 4.0 or less), AVI and Mpeg. Also included is Musical Instrument Digital Interface (MIDI), Apple QuickTime, Macintosh AIFF Resource, Sun Microsystems and NeXT .au and .snd files, as well as basic .wav files.

◄ FIG 1 WINDOWS MEDIA PLAYER WILL PLAY QUICKTIME FILES UNDER WINDOWS NT

Windows Media Player <www.microsoft.com/windows/mediaplayer/download> has a couple of nice features. Playlist allows authors to create entire shows of different pieces of content, and the codec auto-download feature does pretty much what it says: if you need to play a file which uses a codec you don't have, it will be automatically downloaded. There's another feature on the help menu which is supposed to check for a later version of the Media Player itself: as you can see from Fig 2, this doesn't necessarily work. With the Windows Media Player, the video window can be resized as desired, even to as large as full-screen. Of course, this won't increase image resolution, and your hardware almost certainly won't be able to play a video at this size and at full speed.

▼ FIG 2 IN THEORY, YOU CAN CARRY OUT AN ONLINE CHECK FOR A LATER VERSION OF THE WINDOWS MEDIA PLAYER



come across – see panel, above) and whenever installing or re-installing RAS, go to the Services control panel and disable the Remote Access Autodial Manager. I am currently investigating the possibility that the Windows CE services themselves also generate off-network traffic, and I will report back in due course.

Changing drives

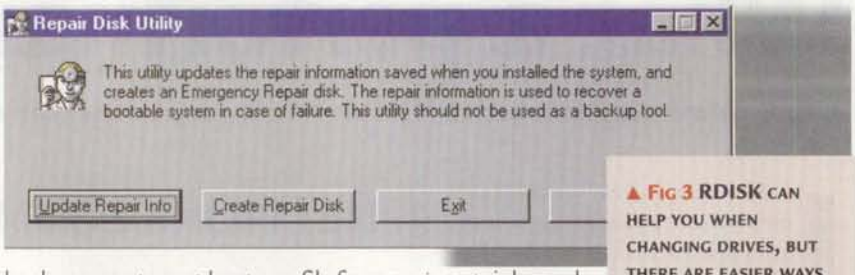
Linda Davies has asked what ought to be an easy question. How does she go about changing the hard drive on her system? It sounds easy, but there's no obvious way to go about this procedure under Windows NT.

The most obvious answer seems to be to remove the old drive, insert the new one, install Windows NT and recover all data and applications from backup. There are two problems with this. Firstly, it means having the system out of action for a considerable period of time while Windows NT is reinstalled; and secondly, the system is not equipped with a tape drive. Why is that important? Megabytes of system, user and application configuration information are stored in the registry, so it is vital to recover the system registry as well as the other disk files. The NTBackup program supplied with Windows NT will only copy the registry to and from the local machine. Here, Linda's machine is backed up across the network by a system elsewhere on the network, which has a SCSI tape drive.

When attempting to backup or recover the registry from tape using NTBackup, note that you have to also backup or restore at least one file from or to the system drive (the drive where the registry files are stored by Windows NT). Otherwise, NTBackup doesn't even show the dialog box where you get the chance to restore the registry. Seagate Backup Exec leads you to believe that it is possible to back up the registry, and it says nothing about not being able to carry out this operation across the network. But of course, it can't, so neither is that a solution.

By the way, if you ever do need to reinstall Windows NT before recovering from backup, make sure you also install the latest service pack, too. There have been instances in the past where changes made in a service pack have rendered tapes written after the service pack was installed (that is, when you took the backup) unreadable by a system without the service pack (that is, when you have just reinstalled NT on the new hard drive). If you use a third-party product like Seagate Backup Exec, that may well require a minimum service pack level, anyway. So, while the restore operation obviously will bring you up to the latest service-pack level, you almost certainly need to apply it first in order for the restore to happen successfully. There are a few ways to back up the registry across the network. The first uses RDISK [Fig 3]. When you run the RDISK utility, which is intended for creating emergency repair disks, one of the options backs up your registry information to the hard drive. Select Update Repair Info, and RDISK will store compressed copies of your registry in the \repair folder in your Windows directory. These can then be copied across the network onto another drive, just like any other files, or backed up across the network onto a tape. Indeed, a normal full tape backup operation would copy these files automatically.

If you ever need to reinstall Windows NT before recovering from backup, make sure you also install the latest service pack



▲ **Fig 3 RDISK can help you when changing drives, but there are easier ways**

Alternatively, you can actually make an emergency repair disk, boot from the Setup disks, select the Repair option and then choose the menu option to restore the registry. This only works if your registry is actually small enough to fit on a floppy disk (mine certainly isn't). The first step, whichever approach you take, is to ensure that the repair files are up to date, by running RDISK. This operation should be part of your regular system maintenance anyway. Note that RDISK does not, by default, back up user account information. If you want this backed up, you need to run RDISK with the undocumented /s option. However, if you use the command RDISK /s then RDISK runs immediately.

But using this technique, you still face the problem of recovering the registry from the files that RDISK saved. There's no easy way to do this. Expanding the files requires the use of the program EXPNDW32.EXE, which only comes with the Resource Kit. Once expanded, you will need to copy the files to where Windows stores the registry files, which is in the folder:

`%systemroot%\system32\config`

And in any case, you cannot do that

SUMMERTIME BLUES

Gary Powell poses an interesting question. When does Windows NT actually implement British Summer Time? Does it follow the rules, and actually change at 0200 in the morning? If so, Gary wonders what happens if you have set the scheduler to run a task at exactly that time. Does it run twice when the clocks go back? Does it get omitted altogether?

A very interesting question, Gary, but I'm not sure I want to stay up until 2am at the end of October to find out the answer. Does anyone else know what happens? What beats me, incidentally, is how citizens of the USA manage to use the scheduler at all, since it uses the 24-hour clock.

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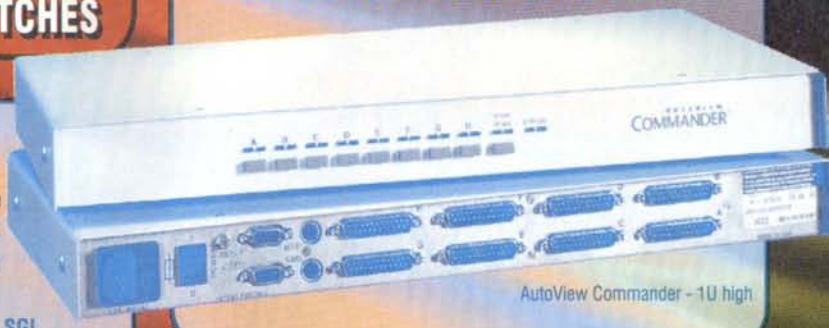

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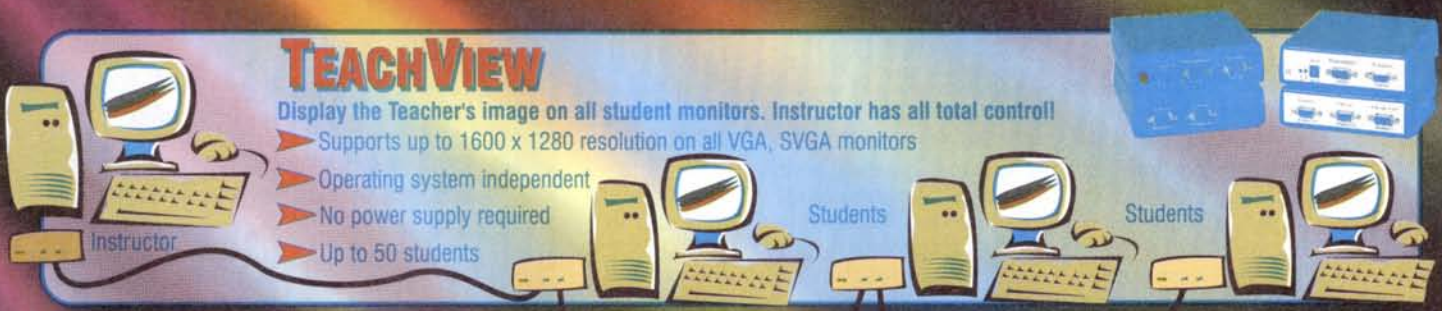

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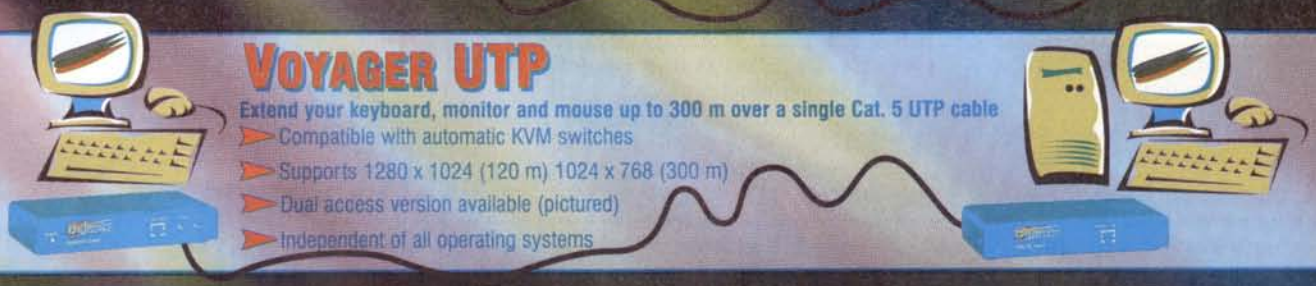

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[FIG 4]

Output for creating NT users

```
NET USER triley password01 /ADD /COMMENT:"Information Services" /COUNTRYCODE:0-
/EXPIRES:NEVER /FULLNAME:"Toby Riley" /HOMEDIR:\\SERVER\TRILEY$ /PASSWORDCHG:YES-
/SCRIPTPATH:NETLOGON_FILE.BAT
NET USER ajones password01 /ADD /COMMENT:"Collections" /COUNTRYCODE:0 /EXPIRES:NEVER-
/FULLNAME:"Andy Jones" /HOMEDIR:\\SERVER\AJONES$ /PASSWORDCHG:YES /SCRIPTPATH:-
NETLOGON_FILE.BAT
NET USER jbloggs password01 /ADD /COMMENT:"Underwriting" /COUNTRYCODE:0 /EXPIRES:-
NEVER /FULLNAME:"Joe Bloggs" /HOMEDIR:\\SERVER\JBLOGGS$ /PASSWORDCHG:YES-
/SCRIPTPATH:NETLOGON_FILE.BAT
NET LOCALGROUP "Information Services" triley /ADD
NET LOCALGROUP "Collections" ajones /ADD
NET LOCALGROUP "Underwriting" jbloggs /ADD
MD D:\HOME\Triley
MD D:\HOME\Ajones
MD D:\HOME\Jbloggs
NET SHARE triley$=D:\HOME\TRILEY /UNLIMITED /REMARK:"Toby Riley's Home Directory" /Y
NET SHARE ajones$=D:\HOME\AJONES /UNLIMITED /REMARK:"Andy Jones's Home Directory" /Y
NET SHARE jbloggs$=D:\HOME\JBLOGGS /UNLIMITED /REMARK:"Joe Bloggs's Home Directory" /Y
CACLS D:\HOME\TRILEY /E /R EVERYONE
CACLS D:\HOME\AJONES /E /R EVERYONE
CACLS D:\HOME\JBLOGGS /E /R EVERYONE
CACLS D:\HOME\TRILEY /E /G ADMINISTRATORS:F
CACLS D:\HOME\AJONES /E /G ADMINISTRATORS:F
CACLS D:\HOME\JBLOGGS /E /G ADMINISTRATORS:F
CACLS D:\HOME\TRILEY /E /G TRILEY:C
CACLS D:\HOME\AJONES /E /G AJONES:C
CACLS D:\HOME\JBLOGGS /E /G JBLOGGS:C
COPY "D:\HOME\LOGINSCRIPTS\Information Services\*.*"  "D:\HOME\Triley"
COPY "D:\HOME\LOGINSCRIPTS\Collections\*.*"  "D:\HOME\Ajones"
COPY "D:\HOME\LOGINSCRIPTS\Underwriting\*.*"  "D:\HOME\Jbloggs"
```

- Denotes that the line of code continues

▲ FIG 4 SAMPLE SCRIPT CREATED BY TOBY RILEY'S EXCEL MACRO

while Windows NT is running: you have to install a second copy of NT, boot from that and restore the files. Indeed, another way of backing up the registry is by installing a second copy of Windows NT on the same drive but in a different directory. When you boot from the second copy, the registry files of the first copy are accessible just like any other files. This is probably the easiest solution and the least likely to go wrong, although it might not be the quickest.

In summary, our procedure will look like this:

1 **Install** a second copy of Windows NT to the hard drive.

2 **Backup** the entire system (including the registry files but excluding the second copy of Windows NT) across the network to a tape drive or hard drive.

3 **Fit** the new hard drive. Install a copy of Windows NT but to a different directory name than was used previously.

4 **Then use** this copy of Windows NT to restore from the backup that you took earlier.

Automating new users

Toby Riley has very kindly sent me an Excel macro which he uses to automatically generate all the commands you need in a script to set up a new-user account. This greatly simplifies the work needed to set up new accounts. I have put the spreadsheet on our cover-mounted CD-ROM this month and you will find it under "Create NT Users.xls". An example of what the output looks like is shown above [Fig 4]. You can, of course, tune this to your own requirements.

This spreadsheet may well be what P. McLaughlin is looking for. He (or she) wants to know whether there is a utility to export and import the user account information from the SAM (Security Accounts Manager), so it can check the names against an existing database of users. Well, not as far as I know, although someone might have written a third-party add-on. However, using a macro such as this, the existing database can be used to populate a spreadsheet and hence a script file.

All you have to do when adding a new user is to type in the user's name and department and the Excel table is then automatically populated with the individual script lines. In Toby's version, clicking on a button drives a macro which then copies all these lines into a spare Excel sheet in a format ready for cutting and pasting into a script file.

PCW CONTACTS

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Connection correction

Without connectivity, the mobility of PDAs is limited. Mark Whitehorn shows you the way to get around this. Plus, the new Psion 3MX.

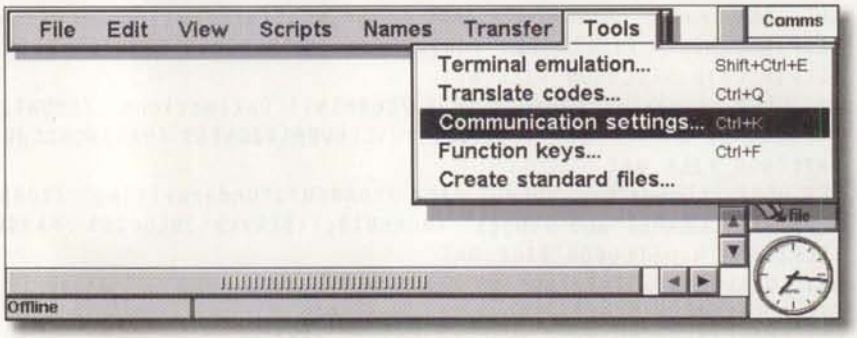
People want to move data between a PDA and a PC or a LAN for several reasons; it all depends on the use to which they put their PDA. Many people produce work (documents, worksheets) on a PDA and want to move it wholesale to the PC for further editing, printing and dispatch across the internet. This is a two-way process because partially-completed work can be moved to the PDA for editing while on the move.

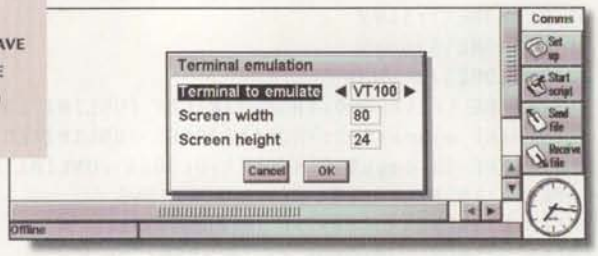
People also use PDAs primarily as an address-list-cum-organiser. Such users are not really concerned with moving specific documents; instead, they want to synchronise data held in applications on both machines. Such people typically use proprietary applications like Microsoft Outlook and Psion Agenda, or Lotus Organizer and Outlook on a WinCE machine. Corporate users maintain a database at work. Typically, it has a proprietary back end such as Oracle and a custom front-end application. These users are keen to move the application to a PDA. A number of interesting problems accompany this, not least of which is maintaining data integrity with a disconnected device.

All these functions can be performed from PDA to PC via a bit of wire and a serial connector on the PC. However, for some PDAs and some applications, the same can also be done via a network connection. This is usually more expensive but offers the promise of a much greater transfer rate.

Net connectivity

The two easiest ways of connecting to the internet are via a service provider or through the LAN at work. There are several PDAs out there – Pilots, Psions, WinCE machines (of various flavours). We cannot possibly cover them all, so I'll try to be as general as possible while describing the most likely options.





FIGS 1 & 2 SOME PDAS HAVE BUILT-IN COMMS SOFTWARE LIKE THIS (IN THE PSION 5)

Let us assume that you want to connect via an internet service provider (ISP). You'll also need a modem. But before you rush off and lay out money on either, you need to know some of the background to all of this comms stuff. Why? Because most ISPs will expect you to be using a PC or a Mac to connect to their service and that is what you haven't got. It's going to make a major difference.

A network connection is more expensive but offers a much greater transfer rate

A tiny slice of history is relevant here. In the good-old days when I was a boy, PCs used DOS. No GUI, just a good old-fashioned text-based interface. When companies like CompuServe and CIX started up, they weren't really ISPs because the internet was still in its infancy. They were Bulletin Boards (BBs) where you could send messages to other users of the same service, read primitive news groups and so on. You used a modem to reach the bulletin board and ran a piece of software on the PC that was known as a terminal emulator. This effectively dumbed-down your PC so that it became a device for sending and receiving text characters. Whatever you typed on the keyboard appeared on the screen and was sent via the modem to the BB. If and when the BB deigned to send characters back, they appeared on-screen. You could issue special commands to send and receive files, but basically the entire exchange with the BB was text-based.

Nowadays, all that has changed. Not only does your PC run some flavour of Windows, but the ISP will provide special "front-end" software which runs on your PC. This software is by no means dumb. In fact, a great deal of the art of providing a good ISP service lies in the cleverness of this software. The smarter it is, the less data has to be transferred down the phone line to you and the faster the service appears to run. So, you plug in and configure the modem, load the front-end software and connect to the ISP. (Yawn... no-one likes history lessons, but the relevance of this one is, hopefully, becoming clear.)

You have a PDA, but a PDA will not run the special software provided by the ISP – not even if it is a WinCE machine. So, unless the ISP happens to provide a special front-end for your particular PDA, you cannot connect to the ISP via the normal route. Even if you could get a connection, you would want to surf the web, for which you would need an internet browser; but neither Netscape nor IE will run on your PDA.

There is a solution, however, otherwise we wouldn't be going through all of this. The first, and potentially easiest, remedy is

to go in via the historical route. Most PDAs either have a terminal emulator built in [Figs 1 & 2] or you can find one on the internet. (Yes, I realise there is a "Catch 22" built in to that statement, but we'll work on it.) If your chosen ISP still provides a text-based interface then you can enter via that. Terminal emulators can be a pain, but their saving grace is that they dumb everything down to the lowest common denominator: the ISP software cannot tell if your machine is a PC or a PDA and neither will it care. It will simply send and receive text characters. This still won't get you to the stage of surfing the web, however, because HTML demands that your machine is running some form of browser.

The second approach is to find some form of software that will run on your PDA and which provides a GUI interface to an ISP and includes a browser. And here we reach another potential stumbling block. Web browsers are, theoretically, very simple. They receive a string of data in HTML format and turn it into text and pictures on your screen.

In practice, modern browsers are large, complex bits of software. The most recent version of Netscape takes so much processing power that it totally socks a 486/25 with 8Mb of RAM. I know – I've just dragged out an old machine and tried it. Now look at your PDA: if it's a Psion 3c, then as much as I dearly love that machine, it lacks the horsepower to run a fully-featured browser at anything like "normal" speed. (*I wonder about the 3MX though? — see panel, below.*) The end result is that browsing from a PDA is usually slow and/or the browser offers a reduced feature set.

Off and on

All this must sound like I'm trying to put you off the whole idea. Well, I most certainly am not. I love playing with these machines and there is oodles of fun to be had in connecting to the internet. But if or when you finally get there, it would be a shame if you were disappointed with the result. A PDA is nothing without software and there has been an explosion of applications appearing in the past six months. All seem to be of interest so, for the next few instalments of this column, I'll try to touch on all these topics in one way or another.

Love story

I think I'm in love (*sigh...*). I've got it bad. There you are, thinking that you are happy in a stable relationship, when suddenly, across a crowded room, your eyes meet. OK, so that was three eyes in total, because the current object of my affections has only one eye (and, yes, technically, that eye does see in infra-red) but hey, love is blind.

The Psion 3MX is my new love. Oddly, it looks and feels more like a 3a than a 3c because the rubbery coating of the Psion 3c has been dropped. According to Psion, that was because it looked rather "nineties" and the 3MX is a machine for the new millennium. According to the scuttlebutt on the newsgroups, it's because the rubber coating tended to peel off and make the Psion look old and tatty before its time. Nevertheless, the change has a delightful side effect. I used to carry my 3a in a custom case that I was forced to abandon when the coefficient of friction of the 3c's surface rendered insertion and extraction impossible. I dug out the case and the new Psion nestles comfortably inside – safe (or at least safer) from the effects of careless handling. However, if this had been the only difference I could have achieved the same effect with a potato peeler.

Another reason for pensioning off the 3c in favour of a Psion 5 was that I craved speed. The 3c stored my full list of names and addresses but the search time was too sluggish. In addition, I found that I was giving the 3c increasingly difficult spreadsheets to calculate and they were becoming slow. Oddly, the migration to the 5 never felt as if it produced the speed gains I was expecting, although I never actually performed any tests (*but see time trials and results, this page and next*).

The great selling point of the 3MX is that it is substantially faster that the 3c. Rising to the challenge, I decided to move the data back but this time to take some measurements. The results were surprising.

How Fast?	Find record	Paste	Recalc 1	Recalc 2
Psion 3c	2	9	6	10
Psion 3MX	**1**	**3.5**	**2.5**	**4**
Psion 5	3.5	6	7	43
HP 620LX	1	2	1.5	2.5

PSION SENSE

The PsiSync alternative

I had a go at PsiWin in a recent column, only to discover that Bob Walder, who writes *Hands On Networks*, had done the same in the August '98 issue. Bob kindly forwarded this email to me from reader Jake McMurchie jakemc@netcomuk.co.uk:

"I read your article in the August issue of PCW and have to agree with BobWalder's opinion of PsiWin. Fortunately, Psion pointed me to PsiSync, an item of shareware written by Brian Cadge and available from www.kerswell.demon.co.uk." This software allows full and easy transfer of information between Outlook Contacts, Calendar and Notes files, and Psion agenda and database files, neatly setting up the notes as entries in a database on the Psion. It won't translate Word files to your PC, but since you have to shell out for PsiWin if you want the connector cable, you can use the Psion software for that. And the best thing about it? It's yours for £14. So, if you are unhappy with PsiWin, try this.

Psion tip of the month

If you are performing any spreadsheet calculations, zoom in as far as possible if you need to perform a major recalc – it really does seem to make a significant difference to the speed. This applies particularly to the 5, but also to the other models.

TIPS AND TRICKS FOR WIN CE

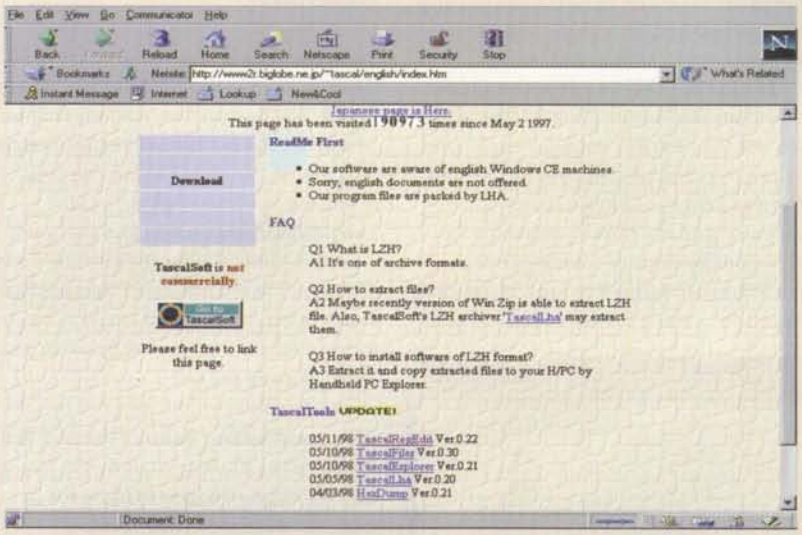
Reader Jon Whiten whiten@usa.net recommends a great freeware site at www2r.biglobe.ne.jp/~tascal/english/index.htm.
It includes such items as:
TascalLha (compression software)
HexDump (hex file viewer)
TascalSearch (file searcher)
Daughter in the box (a simple board game)
TascalFiler (file manager)
TascalExplorer (file manager)
TascalWPC (a utility for changing windows wallpaper)
Bmp2bp (bitmap file converter)
TascalRegedit (registry editor)
I have looked at this site before (*see the screenshots, below*) and it appears to be run by a real enthusiast who seems happy to write really good shareware.

If you have access to a network (or a Network Interface Card in your PC) and have Windows CE 2.0, go and buy a PCMCIA network card and you will find that Backup, Active Sync and program installation are much faster.

FROM THE TASCAL SITE, AN INTRIGUING GAME. YOU HAVE TO "TAKE OUT AN INNOCENT GIRL WHO KNOWS NOTHING OF THE WORLD"...

...AND FROM THE SAME SITE, IMAGES FOR YOUR WINCE MACHINE

THE TASCAL WEB SITE POINTS OUT THAT ITS "SOFTWARE ARE [SIC] AWARE OF ENGLISH WINDOWS CE MACHINES"



Time trials

I carried out four tests: one in the database and three in the spreadsheet.

Find record. The time, in seconds, to find the 466th database record out of 469.

Paste. The time, in seconds, to paste the formula =RAND to 1,000 cells with the screen fully zoomed-in (i.e. large cells, few visible).

Recalc 1. The time, in seconds, to recalculate =RAND in 1,000 cells with the screen fully zoomed-in (i.e. large cells, few visible).

Recalc 2. The time, in seconds, to recalculate =RAND in 1,000 cells with the screen fully zoomed-out (i.e. small cells, many visible).

Psion is right: the 3MX is considerably faster than the 3c (*see the table, "How Fast?", p265*). Fair enough, it is essentially the same machine with a faster processor. Interestingly, the 3MX is also faster than the 5. Indeed, the results for the 5 suggest that it is not significantly faster than the 3c at processing data (I'd always had my suspicions after I swapped). The main speed hit on the 5 seems to be screen redraw.

Once I started speed-testing, I couldn't resist doing the same tests on a WinCE machine, the trusty HP 620LX. This was just under twice as fast as the fastest Psion, which is what you might hope considering the price difference between the two machines.

The speed factor

The take home message about speed is that if it is your number one priority, try out a WinCE machine. (Remember, though, that not all WinCE machines are created equal, so other makes may differ from the HP620.) If speed is an important but not overriding consideration, think about the 3MX because, for the price, it really does scream along. But of course, speed isn't everything, so all the other factors — keyboard, screen and so on — which make up a PDA are still likely to be more important to most people.

PCW CONTACTS

Mark Whitehorn *welcomes readers' correspondence and ideas for the Hands On PDAs column. Contact him via the PCW editorial office (address, p10) or email* **pda@pcw.co.uk**.

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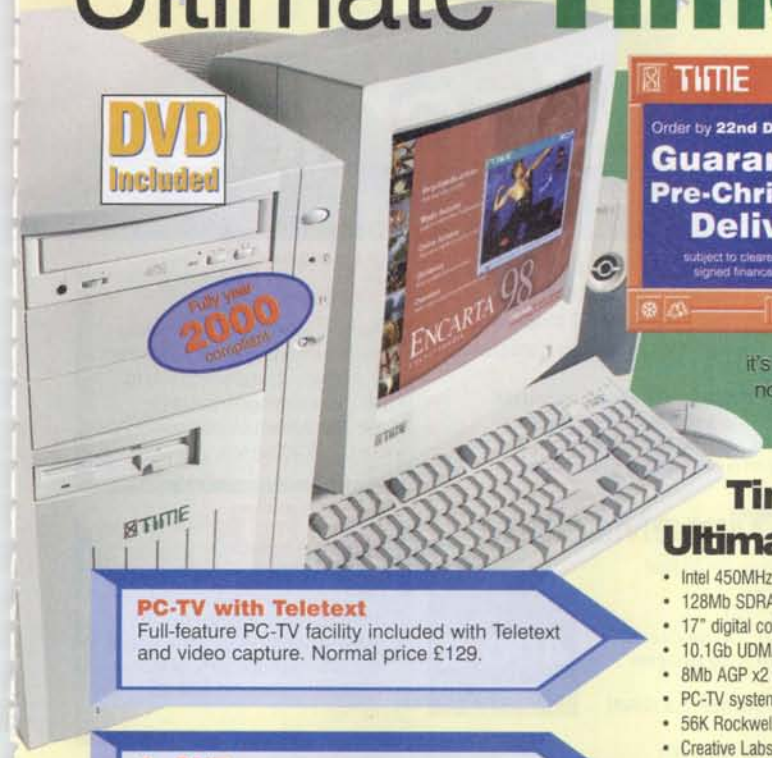

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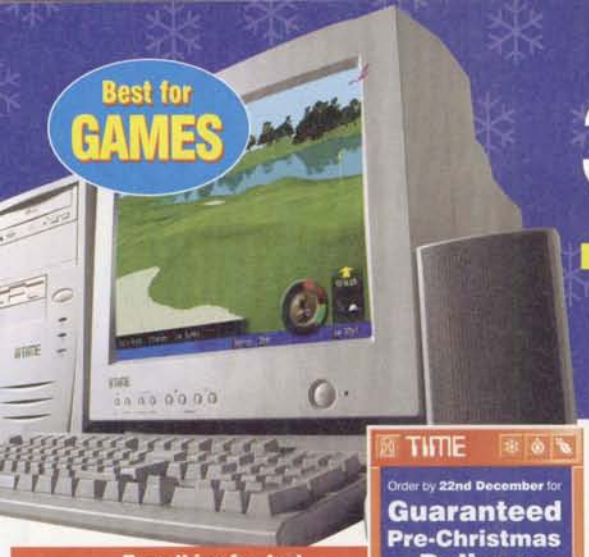

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Linux: is it the one for you?

Chris Bidmead asks why users should convert to using Linux instead of Windows. Plus, details on Primergy, the new server from Siemens-Nixdorf.

My postbag suggests that there are some people out there who think Microsoft Windows defines computing, and they expect Linux to fit that definition. It doesn't. The problem seems to have got worse now that *The Economist*, *Forbes Magazine*, *The Sunday Times* and other pillars of the establishment have started promoting Linux as "the next Windows" or some such nonsense. This month and for a couple of months after that, I'm running a separate workshop [*see page 242*] for existing Windows users who want to get started with Linux. I thought I'd turn over some space in this column to the more general question: why Linux? If you're about to plunge in, or even if you're an existing Linux user who hasn't asked yourself this question yet, it's worth taking time to come up with some useful answers.

Here are some of my reasons. Firstly, I think Linux is a very good operating system — more robust and more versatile than Windows or Windows NT. I also appreciate the fact that it's open source (see www.opensource.org) and all that implies — robust, versatile and much more. I like the fact that it's based on the design of Unix, in many ways the ultimate (intelligent) end-user operating system, built like clockwork in a way that makes it understandable from the ground up — if you're prepared to invest the time and trouble getting to know it. That's why I use Linux, as my main production operating system in fact. Your answers may be different, but if you're installing Linux for the first time, you do need to sort out what they are before you get started.

PARTITION IT FOR FREE

The following tip has come in from Andrew Aylett <the.idiot@mindless.com>, whose problem was trying to resize a FAT32 partition to make room for his new copy of Suse Linux. Fips, the traditional DOS-based partition shifter, comes with most Linux distributions but I believe it doesn't (yet) handle FAT32. I have an alternative suggestion which could prove rather useful: get Partition Resizer from Zeleps <http://members.xoom.com/Zeleps>. It supports both FAT16 and FAT32! I think that it should get a little more exposure, as most people still think Partition Magic is the only way to go without just wiping everything with fdisk.

OK, this message from Andrew has literally popped up on my desktop while I'm writing this month's column, so I haven't had a chance to try it out. If you give it a go, do write in and let me know how you get on [*"PCW Contacts", p271*]. The author, Zeleps, or John Lagonikas , says the software is free, but asks you to send him a postcard if you like it.

Leaving the world of Microsoft

If you're coming to Linux from Windows, there are important differences to be on the lookout for:

Varieties

There are a number of different free Unix-like operating systems, known as Unices. Linux is the one I get the most questions about in my email for this column. But the choice doesn't end there. Although they all use the same kernel (albeit with different release numbers), there are also several rather different Linux distributions, each with its own philosophy, file-system layout, library set and so on. There are multiple different versions of Windows, too (3.x, 95, 98, NT and CE) and actually these differ in essentials much more than Linux distributions. But without the comfort of costly marketing to "position" its various distributions, the wide choice of different Linuxes can be confusing to the beginner.

I think Linux is a very good operating system — more robust and versatile than Windows or Windows NT

The GUI

Compounding this confusion is the fact that there's no "standard" graphical user interface for Linux. This has really baffled some contributors to my mailbag, who are accustomed to think of the GUI as an integral part of the operating system. Like Unix in general, Linux separates out the front-end from the core operating system and runs it more or less as just another application. Actually, the connection is even looser than this description implies, because the GUI is a "network" application — you can run the GUI on one machine and the operating system on another.

The "glue" that binds the GUI to the operating system is called "The X Window System", or just "X". You'll frequently see this referred to as "X-Windows", which is wrong. But I seem to be fighting a losing battle over this. More worrying than the misnomer is the common confusion between X and the GUI itself. They're not the same thing, which is why, although X is standard across all Linux distributions (and most Unices), the GUIs can be very different indeed.

Installation

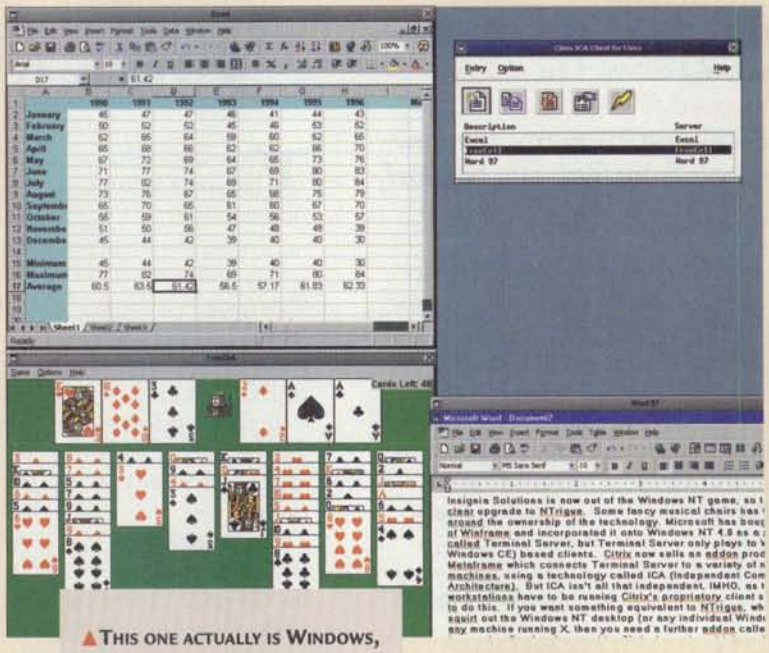
These days Linux is probably easier to install from scratch than Windows. But most users don't install Windows from

NOW THAT'S MAGIC!

Daniel Power runs POW!, which distributes PowerQuest's software here in the UK. Probably its best-known package is Partition Magic, a handy way to shift around and resize your existing Windows and DOS partition to make room for other operating systems. However, the new version goes even further because it now knows how to handle Linux partitions.

I used my new Partition Magic on the Windows 95/Linux dual-boot installation on my Scenic Mobile 500 portable. As a test I tried snipping 2Mb off the Linux swap disk and adding this to the Linux ext2 partition. Setting up the layout for the new partitions took only moments. Once you're happy with the new arrangement, you apply the changes, or you can back off, with no harm done. The various careful batch processes for shifting around the data took about ten minutes. Partition Magic's graphical user interface (running under Windows 95) has always allowed you to resize and move Windows partitions around with the tip of your mouse pointer, but now it can do the same thing with Linux and Linux swap partitions. Very impressive.

The program comes with several wizards for performing routine tasks. I ran one of these, called Analyze and Recommend, and it offered to optimise my hard-disk space. I was sceptical: the Mobile 500 only has a 1Gb hard disk, and the three partitions – Windows 95, Linux, and Linux swap – cram it to the limits. Yet the Wizard saw the opportunity to reduce the cluster size in the FAT partition and offered to reclaim a massive 159.5Mb. Curiously, it spoke of creating a "new logical partition" so that I could use the newly reclaimed space.



▲ THIS ONE ACTUALLY IS WINDOWS, RUNNING ON MY SCENIC 500 PORTABLE. AS YOU CAN SEE, HALF THE DRIVE BELONGS TO LINUX, AND NOW, IN ITS VERSION 4.0 MANIFESTATION, PARTITION MAGIC KNOWS HOW TO RESHAPE BOTH THE LINUX EXT2 AND LINUX SWAP PARTITIONS

Before commiting to this, I decided to explore the Wizard's next move. Ah, glad I did. The Wizard told me it had detected a single partition on my hard disk and offered to help me "organise my data better". I really didn't like the sound of this. The Wizard and I didn't seem to share the same understanding of the partition table, so I decided to back off.

Conclusion: the basic partition-moving seems fine, but I'm wary of any help from those Wizards, who don't seem to have been informed about the arrival of Linux. I'll check this out more thoroughly and report back.

scratch, because it comes with the hardware. Modern operating systems are complex: installing Linux can be complex too. And it doesn't make life easier if, like most people getting started with Linux, you choose to install Linux as an addition rather than a replacement for Windows.

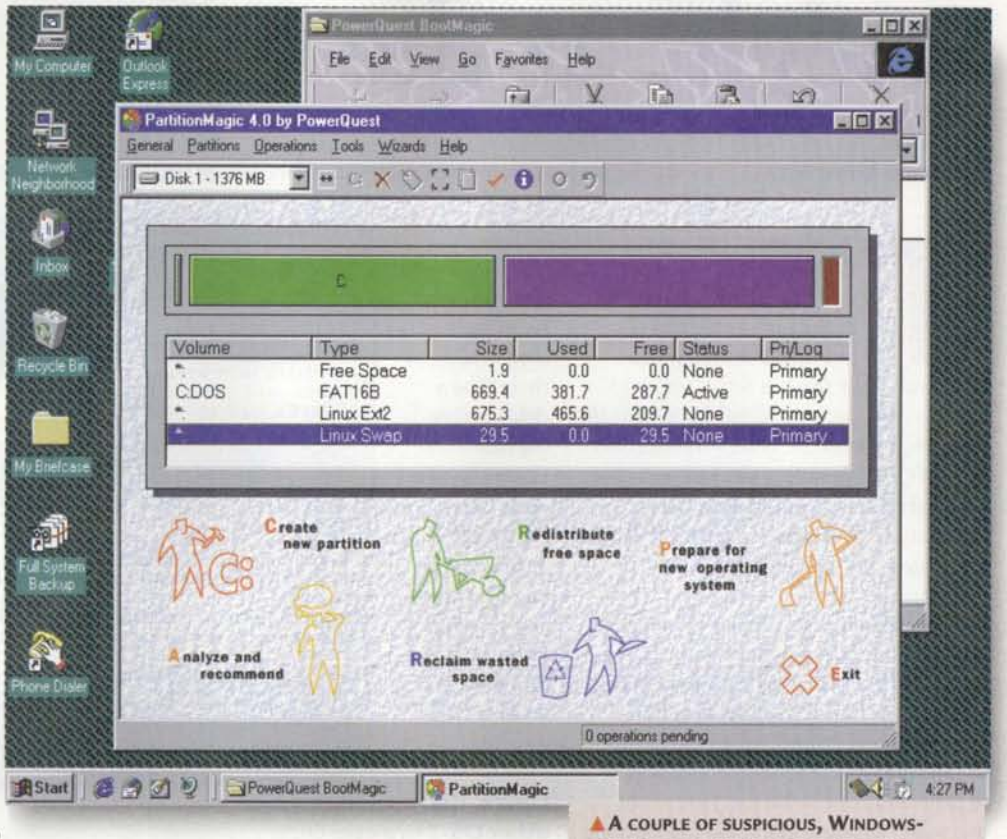
There's a very good introduction to Linux for Windows users in the DOS-Win-to-Linux HOWTO, which you can find, for example, at **http://tsx-11.mit.edu/pub/linux/docs/HOWTO**.

Primergy finally turns on the power

Back in September I introduced you to the new Primergy server from Siemens-Nixdorf that has taken up residence on my network. I told you about my plans for this as part of the Unix/Windows integration effort I'm exploring here. As long-term readers of this column will know, since early 1996 I've been running server software called NTrigue, which allows me to bring up NT in an X Window on any of the machines on my network. Ntrigue was sold by Insignia Solutions, and effectively packages some special multi-user fixes (called Winframe) from a company called Citrix <www.citrix.com> with some clever X11 software co-developed with the X terminal specialist, NCD <www.ncd.com>, all sitting on top of Windows NT version 3.51.

Insignia Solutions no longer sells NTrigue. A complicated game of musical chairs has taken place around the ownership of the technology.

Microsoft has bought the core of Winframe from Citrix and incorporated it into Windows NT 4.0 as a product called Terminal Server, but Terminal Server only plays to Windows (or Windows CE) based clients. Citrix in turn has bought Insignia's contribution to the NTRigue product, and now sells a Terminal Server add-on called Metaframe which connects Terminal Server to a variety of non-Windows machines, using a technology called ICA (Independent Computing Architecture). But ICA isn't all that independent, as the workstations have to be running Citrix's proprietory client software to do this. If you want something equivalent to NTrigue, which can squirt out the Windows NT desktop (or any individual Windows app) to any machine running X, then you need a further add-on on top of Metaframe, called UIS (Unix Integration Services). UIS is the stuff originally developed by Insignia, so it's now owned by Citrix. However, Citrix only sells it through third parties: currently NCD and Tektronix. I did say this was rather complicated!



▲ A COUPLE OF SUSPICIOUS, WINDOWS-LOOKING SCREENSHOTS FOR THE UNIX COLUMN THIS MONTH. THIS ONE IS ACTUALLY MY CALDERA OPENLINUX AFTERSTEP DESKTOP RUNNING CITRIX ICA CLIENT WINDOWS THAT ARE 'APPEARANCES' OF WINDOWS APPS RUNNING ON THE PRIMERGY SERVER. THE WINDOW IN THE TOP RIGHT-HAND CORNER IS THE (LOCALLY RUNNING) ICA CLIENT MANAGER, IN WHICH YOU SET UP CONNECTIONS TO THE SERVER

As reported in the September issue, I had all this in place – except for UIS, which still wasn't available. My frustration was parallelled by a reader, Aideen McConville <aideen@persimmon.co.uk> who, as a system administrator for the web client specialist company Persimmon, is also an NTrigue user. Aideen had been sent Terminal Server direct from Microsoft, but says she was "disappointed to discover that we couldn't do anything useful to it from our Unix X workstations." Aideen's solution was brilliant. Rather than wait for UIS, she put the Terminal Server Windows NT client software on top of Ntrigue. The NT client produces an appearance of the Windows Terminal Server screen or application on the Ntrigue machine, and NTrigue relays this across to the Unix X clients. She writes: "OK – a little dodgy, maybe, but much to my surprise it worked... well, to a degree at least. I was able to run Lotus ScreenCam Player [which is not supported on NT 3.51] but only once per session. Repeating the exercise produced a Dr Watson."

A complicated game of musical chairs has taken place around this technology

Three months after installing Terminal Server and Metaframe on the Primergy I managed finally to get hold of UIS. For the first time after a long, patient wait I was able to bring up Windows NT 4.0 on my various Unix workstations. Adding UIS to the Terminal Server/Metaframe mix has the huge advantage that it allows any system with an X server to participate. It also handles 16-bit colour: the ICA clients only do eight-bit. However, it lacks some very useful ICA refinements like being able to treat the local diskettes and the hard drive on the client machine as if they were directly attached to the server. If I were running, say, Microsoft Word on the Primergy, I might want to be working on documents stored on my Linux machine's hard drive. With UIS, you can't do this.

Amazingly, this problem was solved the following week when Citrix released its ICA Client for Linux <www.citrix.com/>. It's free of charge (but not free software). As you can see from the screenshot above, I now have all the facilities and applications of Windows NT 4.0 available on my Linux machines. Except that there really isn't that much that I need to do under Windows these days... Well, FreeCell is good.

PCW CONTACTS

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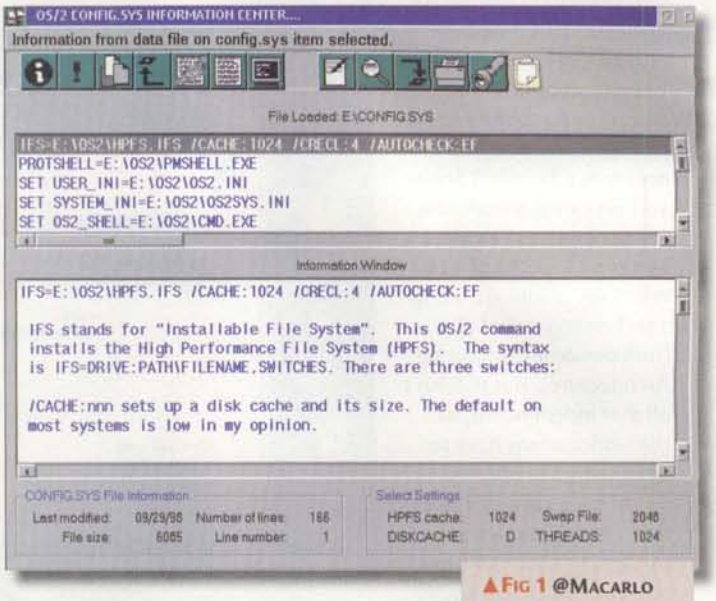
Partition Magic 4.0 costs £49.95 for a single-machine licence. Contact POW! on 01202 716726.

A night at the Opera

Terence Green catches up with developments in the browser world of Opera and WarpZilla.

The release of Netscape Communicator 4.04 for OS/2 Warp was imminent at the time I filed this month's column. If you can't wait, look for it at http://service5.boulder.ibm.com/pcpd.nsf/OCOMM40+Home. It should be good – the second beta of Communicator worked well. The finished version should be a must-have, especially for overseas readers as it will be available in 18 languages.

While we're on the subject of browsers, it's worth mentioning that there are two OS/2 Warp browser projects under way and one text-mode browser available. The WarpZilla project is part of the effort to take the Netscape source and port it to other platforms. Back in January of this year, Netscape made the source code for Communicator freely available, whereupon several projects to port it to other platforms started up. Netscape set up a clearing house, called Mozilla after the codename for the original Netscape Navigator browser, and the Warp porting effort was called WarpZilla. This project is a voluntary effort, not connected in any way with the IBM Netscape Communicator 4.04. WarpZilla has not yet produced a real beta although an early version was posted on the internet. This was based on work which has since been discarded, as earlier in 1998 Mozilla decided to change to a new layout engine called NGLayout (for New Generation). As a result, it looks like there'll be a delay before the next WarpZilla test code based on NGLayout appears. You can find news and pointers to the Warp material at www.mozillaZine.org/.



▲ **Fig 1** @Macarlo explains how to run Opera for 16-bit Windows in a Win-OS/2 session

Opera, the other OS/2 browser under development [Fig 1], seems to have run into trouble with Open32, the Lotus/IBM technology that was used to port Lotus SmartSuite for Warp 4 from the 32-bit Windows version. We remember how many years it took for that product to arrive, so we can only hope that the Opera team manages to crack the problems quicker. You can track progress at www.operasoftware.com/alt_os.html, but if you really want to run a thin browser under OS/2 there's always the 16-bit Windows version. @Macarlo has instructions for using the Opera 3.5 beta for Windows in a Warp 4 Win-OS/2 session at www.geocities.com/SiliconValley/Horizon/5423/operabeta35.htm. The last word on browsers for the time being is that Lynx 2.8 for OS/2 is now available from the Hobbes archive. It should be in the http://hobbes.nmsu.edu/pub/os2/apps/internet/www/browser/ directory. Lynx is a text mode browser – ideal for command-line users.

Readers' favourites

If, like me, you're old enough to remember XTree Gold, you'll want to follow up the suggestion from reader Holger Granholm to download ZTreeBold [Fig2], an OS/2 text mode program that mimics XTree Gold's way with files and directories. I hate to admit it, but when I graduated from DOS and Windows to OS/2 I continued to use XTree for housekeeping. It was only when I started playing with Windows 95 that we finally parted company because it (95) seemed to make XTree go crazy.

While we're talking about the weird stuff that Windows 95 does to FAT to make long filenames work, does anyone

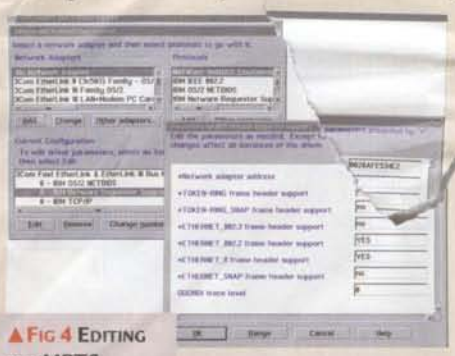
FIX PAK #8 ON THE COVER CD

Fix Pak #8 for Warp 4 didn't make it to last month's *PCW* cover-mounted CD because there were a few glitches in the first release and a potential problem with the installer. However, these were rapidly sorted and it is on this month's cover-mounted CD, so there should now be no problems. Well, almost none! After a slight contretemps with Fix Paks, reader Ian Park suggested that Fix Packs on the covermounted CD should be accompanied by a list of contra-indications. It's a fair point, but there are really only two contras to remember: please don't install a Fix Pak unless you really need to; and do read the README files – they have full information on how to install, what to be wary of, and how to back out of a Fix Pack if there's a problem. Having said that, please note that you have to install Fix Pak #32 or later in order to install the Java and Netscape Communicator 4.04 packages on Warp 3.

BITS AND PIECES

Here are some issues arising from reader problems, Java stuff and an update on an earlier featured utility.

NetWare connection failure. One item I haven't noticed in a README is a reference to NetWare connections failing after installing NetWare client support with Warp. If the Warp NetWare client then fails to find a NetWare server at boot time, it throws up a REQ0815 error: "Program cannot get the connection ID". This problem invariably occurs because the Warp client defaults to 802.3 Ethernet frames whereas NetWare has defaulted to 802.2 frames since 1993. Here's how to fix this [Fig 4]:



▲ FIG 4 EDITING THE MPTS SETTINGS OF THE NETWARE CLIENT FOR WARP

1 **Open an** OS/2 Window and run MPTS. Select "Configure" from the Multi-Protocol Transport Services window. Now, with the "LAN Adapters and protocols" radio button checked in the Configure dialog window, again select "Configure".

2 **With the** "Adapter and Protocol Configuration" window open, move to the section headed "Current Configuration", highlight "IBM NetWare Requester Support" and select Edit.

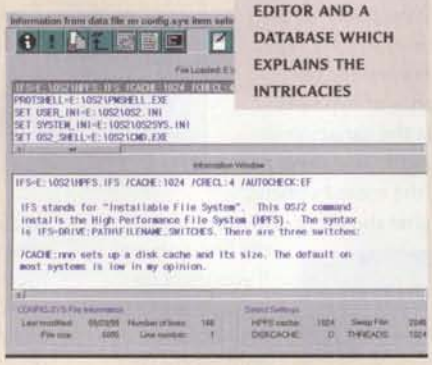
3 **Change the** "yes" next to "*ETHERNET_802.3 frame header support" to a "no" and ensure that there's a "yes" next to "*ETHERNET_802.2 frame header support".

4 **Select OK twice,** then "Close", then "Exit" to get to the Update CONFIG.SYS window. Make sure that the Update box is ticked and then select Exit to make the change. Now reboot, and *voilà*!

The -d option. If you don't use the -d option to create sub-directories when decompressing the Java ZIP files provided on our cover-mounted CD, you'll hit a "file not found" when you run the install program. This information is in the README file; but then, how many readers first extract the README from the ZIP? I know I don't. Doh!

Updating Warp. When updating the Warp installation diskettes with new drivers (from WARPINST.EXE, say) it is sometimes necessary to delete other files in order to make space for the new drivers. If you do this you must also REMark out the corresponding load line in the CONFIG.SYS file on Diskette 1 or else the install will come to a juddering halt. It's in the README. Frankly, my head hurts when I see these huge text files, but more often than not they contain the information you need to recover from problems.

Dialog Enhancer. Richard Castle has updated Dialog Enhancer and taken the opportunity to make it work with Netscape Communicator 4.04 for OS/2. The Netscape support was part of a beta when we heard about it, but should be finalised by now. Dailog Enhancer has added support for German and Spanish, more support for video cards, and there are now more programs supported. Find it at www-student.lboro.ac.uk/~mcrsc/ostrans.html.



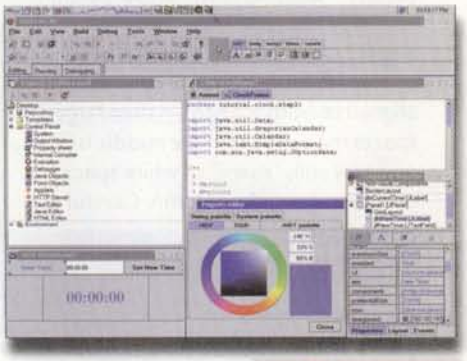
▼ FIG 5 CONFIGINFO IS A CONFIG.SYS EDITOR AND A DATABASE WHICH EXPLAINS THE INTRICACIES

Ace tool. CONFIGINFO is a great tool [Fig 5] which helps you edit your CONFIG.SYS and explains what all the lines mean. It's a free utility, and you can get it from www.buntspecht.de/files/cfginfo6.zip.

▲ FIG 2 ZTREEBOLD IS A SHAREWARE FILE MANAGER WHICH TAKES OVER WHERE XTREE GOLD LEFT OFF

have hard information on the machinations of Windows 98 and FAT32? It's becoming apparent to me that Windows 98 does more to the Boot drive than I had at first thought, but I'm not sure what. Anyone with the answer, please write. You can find ZTreeBold at www.bmtmicro.com/catalog/ztreebold.html.

The IBM bloke who said we could put VisualAge for Java 2.0 on our cover disc has gone all quiet so no news on this front. However, reader Jean-Yves Rouffiac has suggested Simplicity for Java, a 100 percent Pure Java development tool. A not-too-big trial download version can be found at www.datarepresentations.com/index.htm. Another 100 percent Pure Java IDE, NetBeans Developer [Fig 3], is offering a free beta for download. Look for it at www.netbeans.com/.



▲ FIG 3 THE NETBEANS IDE WRITTEN IN 100 PERCENT PURE JAVA RUNS ON WARP AND MANY OTHER PLATFORMS

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Hyphenate and be dashed

When it comes to hyphens, you needn't let Word have the last word on the issue. Tim Nott shows you how to control hyphens in text, and use them to maximum advantage.

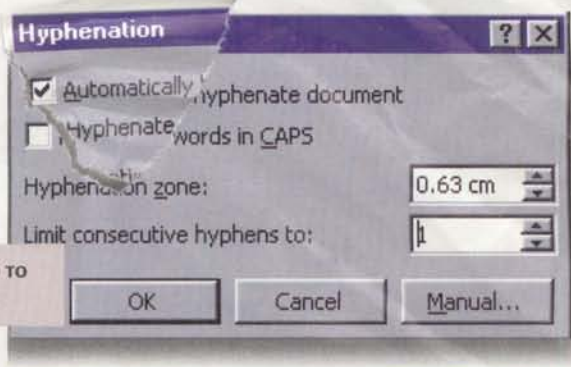
QUICK WORD TIPS

- **If you click on** a tab, margin stop or table division in the Word ruler with both mouse buttons (or Alt+left button) you get dimensioned arrows showing the exact position of the stop. This works with margins, tables and headers/footers in the vertical ruler, too.
- **If you hit** Shift+F3 in Word, any selected text will be toggled between ALL CAPITALS, all lower case or All Initial Capitals.

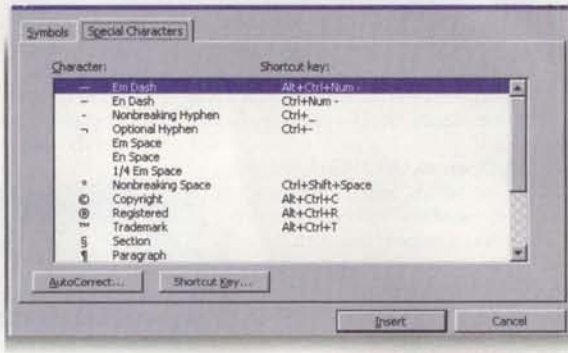
The grammatical use of hyphens is either a sort of marriage ceremony between pairs of words such as five-pound, year-old, high-heeled, clarifying meaning; or a divorce that clarifies pronunciation: co-operative, re-enter. You've probably found that there's some disagreement between Word's spelling and grammar checkers on this. If you type something such as "news-stand", for example, the subsequent game of "proofing ping-pong", though initially amusing, rapidly becomes tediously recursive.

Easier reading

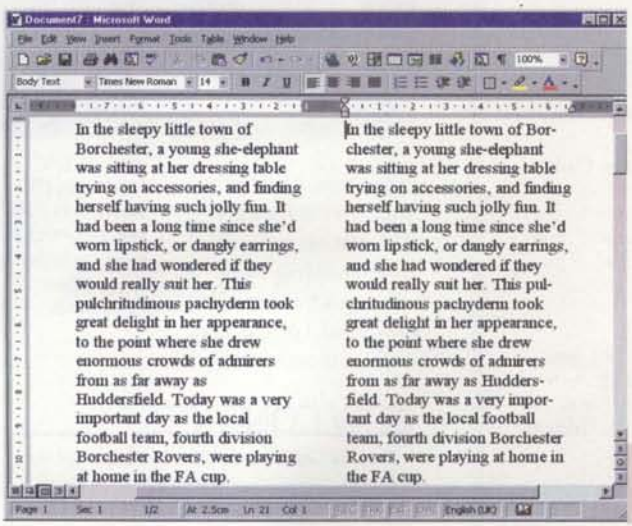
Hyphens also serve a typographical purpose. Text set in multiple columns can often have poor "colour" or visual density, especially with narrow columns and large character size. If the text is left-aligned, then line lengths will be very uneven. If the text is justified – that is, aligned to both margins – then large spaces may appear in the middle of lines, or worse still, "rivers" of white space meander down the column. Careful use of hyphens can rectify this. Most word processors have the means to add cosmetic hyphens automatically, as and when needed. In Word, this feature is tucked away in the Tools, Language sub-menu. Digging into the options, you can limit the number of consecutive lines ending in a hyphen, stop words in all-uppercase being hyphenated, and specify the width of the hyphenation zone. The latter trades off the frequency of hyphens against the variation in line length. The lower the value, the more hyphens; the higher the value, the more ragged the line-endings. If you want to retain control over hyphenation, or only hyphenate part of a document, choose the Manual button. This will not only prompt you for confirmation for each word that is to be hyphenated, but will also give you a choice of where it is to be hyphenated, avoiding potential embarrassment with awkward words such as Penistone (an obscure town in Yorkshire) or Arsenal (an obscure football club in London).



▶ GETTING WORD TO DO THE WORK



▲ ADVANCED HYPHENS AND HOW TO GET THEM



◀ IMPROVING RAGGED LINES WITH HYPHENS

Special hyphens

There are times, however, when you want to use a hyphen that never breaks over two lines, and I'm grateful to our Perugian correspondent, Bob Monroe, for the following. Non-breaking hyphens (Ctrl+Shift+-) and spaces (Ctrl+Shift+space) are useful for things such as phone numbers, which you don't want split over two lines. In Word 6, a non-breaking hyphen looks like an ordinary

Questions & answers

Q How can I get Word to left and right align text on the same line? It was easy enough to do this – say for a price list or contents page – on my old Amstrad PCW, and also in WordPerfect, but I can only left, right or centre an entire line in Word.

LESLIE CATON

A *It's possible, but a little more fiddly. There are two ways: first you can set right-aligned and centred tabs. Make sure the ruler is visible and click on the small button on the left to cycle between the choices. An L shape is a left tab, a mirrored L a right tab, and an inverted T a centred tab, and with a dot it becomes a decimal tab, which aligns figures around their decimal point. Click anywhere on the ruler to set the tab — you can then drag them into position or remove them by dragging down off the ruler. The second, and more flexible way is to use a table, as you can change the alignment of each column or even each cell. This also makes it easy to format the text in each column, say if you want your items in roman and the prices in italic. However, if you want leaders (rows of dots or dashes between the left- and right-aligned items) you'll need to use tabs and format them from the Format, Paragraph, Tabs dialog.*

▲ LEFT AND RIGHT — ABOVE WITH A TABLE, BELOW WITH TABS

Q I have tried to copy formulas while using tables in Microsoft Word but the program copies the cell result instead of the formula. Please advise me whether it is possible. If not, what steps are you taking to facilitate this feature?

DR EDWARD TIAGHA

A *I've tried doing this and it seems what is happening is that the formula is being copied but it isn't being recalculated. Highlight the cell, row or entire table and press F9 — that will update the results of the formula. You can check by switching between seeing the formulae and their results. To do this, turn field codes on and off, either from Tools, Options, View or by using the Alt+F9 keyboard shortcut.*

Q Word 97 seems to have an annoying habit of occasionally putting footnotes on the following page, even when the reference is only halfway down the current page. I have met others who have suffered this problem but cannot find any fix. Do you have any suggestions?

TONY MILNER

A *This is a problem which Microsoft has confirmed and is researching. However, as the company admits it goes right back to version 2, don't hold your breath. Basically it's due to lack of space and there are various workarounds. In Word 97 you can turn-off Printer metrics from Tools, Options, Compatibility. On all versions you can try decreasing the point size and line spacing of the footnote text style from Format, Styles. You can also reduce the line spacing/point size of the body text, reduce the size of the page margins, or reduce the line spacing of the footnote separator by going to View, Normal followed by View, Footnotes. Select Footnote Separator from the droplist, then highlight the separator in the pane below. Then set Format, Paragraph, Spacing to a lower value.*

FRENCH CONNECTION

Bob Reksten of Monaco is looking for a word-processing "plug-in". He says: "Sometimes I can't remember a word in English when I know it in French and at other times it's the other way around. What I would like to find is a translation dictionary and thesaurus package. When typing a word, I'd like to hit a button, choose a language, then ask for a correction, a synonym or a translation." Does anybody know of such a thing?

hyphen unless you check the "Show optional hyphens" box from the Tools, Options, View tab, in which case it becomes longer and higher. For mysterious reasons, the non-breaking hyphen shows as a wide, blank space in Word 97 unless you enable "Show tab characters" from the same dialogue. This has the downside of showing all your tabs as well.

If you don't want to avail yourself of auto-hyphenation, then optional hyphens (Ctrl+-) are useful for breaking up long words. Should the word fall at the end of a line, causing uneven length, it will be broken at the optional hyphen. Should it not, then no hyphen appears. These appear as an L on its side if you choose to show them as described. Very rarely, if a line with an optional hyphen showing is tightly packed, this can have the unnerving effect of pushing the bottom line of text off the page into oblivion as far as What You See is concerned. What You Get, thankfully, is unaffected.

PCW CONTACTS

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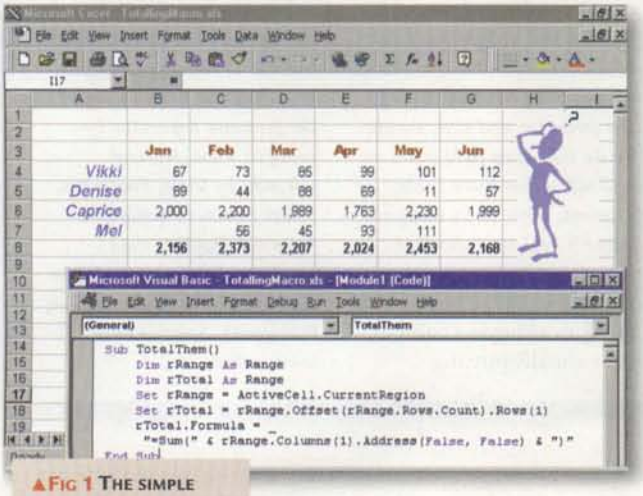
You can count on it

Is totting up specific items in an Excel list driving you to distraction? Stephen Wells shows you an alternative way to do it. And, how to total something before you know it.

Last month, a reader was asking for a way to count the number of many items in an Excel-filtered list. I suggested three methods: Data, AutoFilter, which changes the SUM tool to SUBTOTAL; inserting the SUBTOTAL function yourself; or using the built-in Data, Subtotal feature. He later came back to me and clarified that he didn't want a total of all the items in a column, but the number of specific ones, like a column of text test results with Bs and Fs in it.



▲FIG 1 THE SIMPLE MACRO AT THE BOTTOM AUTOMATICALLY ADDS TOTALS TO THE FOOT OF THE TABLE, NO MATTER HOW WIDE OR DEEP

The COUNTIF function could be used here. If you want to find the number of Bs in column M, and the answer is to be displayed in another column, you would enter

```
=COUNTIF(M:M,"B")
```

If it's to go in the same column, you instead might use

```
=COUNTIF(M2:M100,"B").
```

Here's a variation, asked for by another reader. He wants to include a macro within a programmed application which will enter totals at the foot of all his columns when he doesn't know how many columns or rows there will be. Fig 1 gives an example. Imagine the table on the worksheet with row 8 blank.

[FIG 2]

```
Sub TotalThem()
   Dim rRange As Range
   Dim rTotal As Range
   Set rRange = ActiveCell.CurrentRegion
   Set rTotal = rRange.Offset(rRange.Rows.Count).Rows(1)
   rTotal.Formula = _
    "=Sum(" & rRange.Columns(1).Address(False, False) &
")"
End Sub
```

1 Open the Visual Basic Editor using Alt+F11.

2 Enter the short listing given in Fig 2. Save your work.

3 Click within the worksheet table. Press Alt+F8, then Enter. The macro will enter the totals in row 8. If you want row 8 to be blank and the totals in row 9, change line 5 of the listing so that .Rows(1) reads .Rows(2).

What the macro does is look at the current region. This is the area around the cell you clicked, going as far as the first blank row and column. Then it offsets this by one (.Rows(1)) or two (.Rows(2)) rows. It then inserts as many SUM functions as are called for, which in this example is six.

As Fig 1 shows, there can be blank cells in the range and the macro will ignore graphics. To avoid displaying a zero beneath the labels in column A, uncheck the Zero values box under Tools, Options, View. If you have Excel 97, instead of entering the macro, you can load the file TotallingMacro.xls which is on this month's cover-mounted CD-ROM. This worksheet offers the same example.

Protection measure

It's a rare month when I don't receive a plea for a method to stop other people in an office changing a reader's Excel workbook. Typically, they have protected all or part of it with a password and then given the password to a friend. Said friend then copies the file with another name and steals their work. Few people have the patience to study the complex rules of Excel formatting, so this tip will usually slow up such pesky miscreants.

Choose Format, Cells, Number, Custom and in the Type box, enter (*all on one line*):

```
"Property of Fred Smith"
;;;"Property of Fred Smith"
```

Use your name instead of Fred Smith.

Set the Alignment for the cell to Horizontal, Centre. You can also add to the mystery by changing Font, Colour, to an

A FREE HAND

Microsoft offers a number of useful interactive web sites which help you troubleshoot an assortment of common Excel problems. Keep the Excel file open which demonstrates your quandary while you view the pages. You will be asked to try solutions to your problem as you move through the questions and answers. One such site is at http://support.microsoft.com/support/tshoot/xlfile7.asp.

Questions & *answers*

Q I saw your answer concerning the Euro symbol for Office97. What about us users of Office95?

ALEKSANDAR RASPOPOVIC

a ***There are developments on this situation breaking every day. Have a look at www.eu.microsoft.com/windows/euro.asp and download the file W95_Euro.exe.***

Q In an Excel spreadsheet to calculate income, expenses and profit I want to run a macro depending on the outcome of the calculations. If there is a profit, one macro will run, and if there is a loss, a different macro will run. Will the IF function do this? If not, is there another function that will?

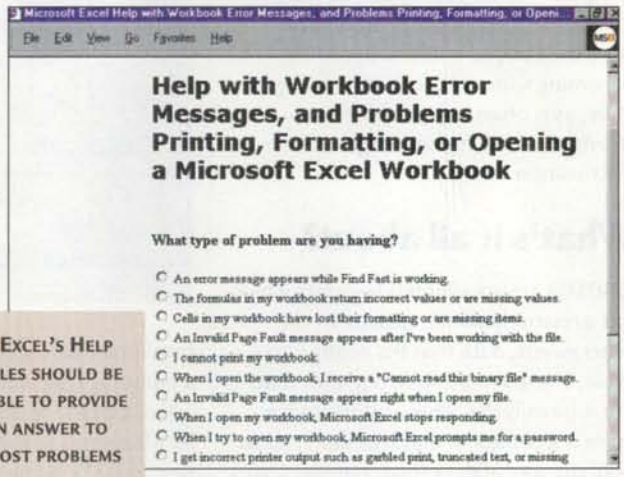
ADRIAN EMERSON

a ***Funnily enough, dear old supposedly outdated SuperCalc used to allow you to run a macro from within a function (like the IF function) but I don't believe Excel will, on the worksheet at least. However, you can run a macro within an IF statement in a macro. What you have to do is write a macro which includes the IF statement (with your required macro in it) and have the first macro triggered by an event. The event could be as simple as any mouse click.***

Q I have a list of all the BBC TV and radio transmitters in the UK and when they are planned to be temporarily shut down for essential maintenance in the next two years. The file has a sheet for all 80 main transmitting sites, each sheet with a chronological list of work to be done. I need to convert this to a single sheet with transmitter names along the top and dates down the left-hand side, and a sort of "bar graph" arrangement where a coloured filled-in bar represents a shut-down period. This would be a lengthy task to complete manually, but I would be able to do it. Because the information in the spreadsheet is constantly changing, I would like to put a "button" on the spreadsheet somewhere which will activate a macro which automatically does all of the above. Then, at the end of each day, I can just hit the button and obtain an up-to-date version of the converted spreadsheet.

PAUL GARNHAM

a ***Why don't you look at the "Run a macro from a button or graphic control" document in the Help files. You could also take a look at "Consolidate data" which covers five ways of doing what you want. You might find a PivotTable is a solution that works for you. There is nothing in your description that seems unusual to me. It's just a matter of getting down to it.***



▶ EXCEL'S HELP FILES SHOULD BE ABLE TO PROVIDE AN ANSWER TO MOST PROBLEMS

PLUS (AND MINUS) POINTS

Richard Baines says he is having a problem trying to make decimal points line up. Excel recommends that you use the Accounting format rather than the Currency format. But if you want to show negative amounts with brackets, rather than a minus sign, you'll need to use one of the offered Custom formats or create your own. In this case, to get positive numbers to line up with negative numbers, insert an underscore before the final bracket _).

intriguing brown or purple. Whatever the user tries to enter into the cell, whether a word, number or formula, it will display "Property of Fred Smith". Entering a negative number or a zero will just produce a blank cell. You can have those entries produce the phrase, too, if you repeat it in the custom format after the first and second semi-colons, respectively. OK, so if they right-click the mouse and choose Clear Contents, the message will disappear. However, when they try to enter something else in the cell, irritatingly, "Property of Fred Smith" will return. It will also defeat the Delete key. And, you can save this worksheet with another name and Fred will *still* appear. Cut and Paste would beat it, so hold down Alt and drag the scissors button off the Standard toolbar. Then choose Tools, Customise, leave that box open and choose Edit on the menu bar. Now drag the Cut command to anywhere on the Customise box. Close the box. And now it's gone. He or she could still use Ctrl+X or alternatively the Shortcut menu (which can be changed in Word only), but hopefully by this time the troublemaker will have given up messing around.

It's a rare month when I don't receive a plea for a method to stop an Excel workbook being changed

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In the frame

How do you store today's complex data structures in databases? Which comes first, the data or the table? Mark Whitehorn compares two views: UDB or connectivity?

You may be aware of rumblings in the database world about the storing of objects in databases: what objects are, how they should be stored and managed. It's becoming something of a quasi-religious issue, as is often the case when two strong contenders encourage polarisation.

What's it all about?

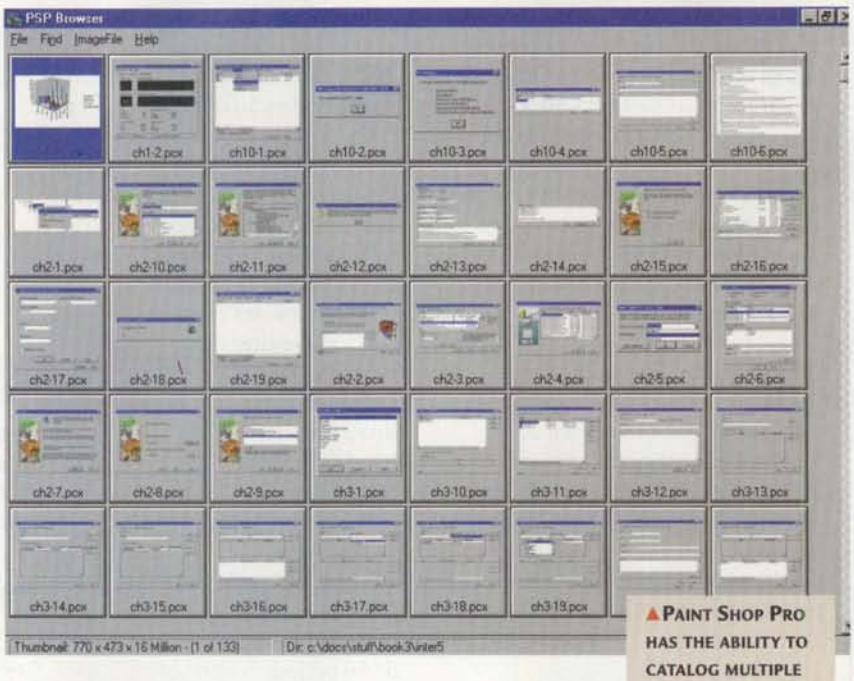
RDBMSs are good at holding data which has a relatively simple structure – in other words, data that fits neatly into a table. There's nothing wrong with that, but it is really the other way around: a table is a container that was designed to hold the sort of data (text, numbers, etc) which, back in the seventies, people, wanted to store and access. However, people are now trying to store more complex data which doesn't fit so neatly into the approved framework.

Consider a digital picture. On the face of it, there is no problem storing this in a table. After all, a digital image is just a long string of noughts and ones. You can think of it as being either a very long text string, or a very big, high-precision number. Either way, all you have to do is define a special data type to hold it. Indeed, many RDBMSs, including Access, have such a data type built in: the BLOB (Binary Large Object) data type. You can declare a field to be of this type and then pop your picture in there. No problem, except... this approach does nothing about giving the user of the database access to all the properties inherent in the original picture. In other words, a picture is more than a string of binary digits: it has one or more subjects, a dominant colour, a focal point, and so on. If it is an image of a painting, that painting probably has an artist, a title, a history, a meaning (...but let's leave modern art out of this discussion!). None of those object properties are stored in the BLOB and therefore the database cannot be queried on those properties.

RDBMSs are good at holding data that fits neatly in a table

This is a shame, because human beings typically want to retrieve images on this sort of criteria, rather than asking for all the pictures that start with 011010111010111010. True, you can attach a viewer to the field that will enable users to look at the image, but that still doesn't help with finding it in the first place. Another approach is to attach one or more fields for keywords, to enable BLOBs to be located. But that adds manual graft and does not cover future searches which may need to scan for characteristics that, at present, we cannot even imagine.

Another example of problematical data is email. Much of my correspondence is now email so I store it for years because it documents my exchanges with other people – my own promises and commitments as well as those which others have made to me. An email is an object with a fairly well-defined set of properties associated with it: time/date of despatch and/or arrival, origin, whether it has been forwarded, its contents and so on. All my email sits in my email system which happens to be called Pegasus. I use Pegasus to search for emails by date, sender etc., whenever I want to locate an old email.



▲ PAINT SHOP PRO HAS THE ABILITY TO CATALOG MULTIPLE IMAGES BUT IS IT AN RDBMS AS WE KNOW IT?

I love Pegasus dearly, but the truth is that it has rather poor search facilities. Why? Because it is not an RDBMS, it's a mail system. RDBMSs are optimised for searching: they have indexes and SQL to allow me to perform very devious searches. Pegasus doesn't; it is optimised to send and receive mail.

This brings us to the nub of the current debate, which is centred around the question of where such data (pictures, sounds, emails) presently stored in non-RDBMS sources, should be stored in future.

The UDB view

The UDB (Universal Database) argument is simple. It says that all data, no matter what, should be stored in a relational database for the simple reason that RDBMSs are optimised for storing and manipulating data. All we have to do is

to extend the relational model. The UDB supporters are fully aware that this means more than simply adding further complex data types. They know that the RDBMS will also have to incorporate viewers, complex "interpreters" which can "understand" the data contained in those data types. But this is being done as we speak. Systems already exist which cannot only store fingerprint images, they can also classify them so that comparisons can be made.

Having all data in RDBMSs earns some huge payoffs because it makes it so easy to correlate information from disparate sources. Currently, if I receive email from colleagues and want to ring them on the internal phone system, I have to swap to a web browser and look up their numbers on a web page. If my email system and the phone book were both back-ended by (say) Oracle, the system could automatically display the number each time I read an internal email.

The UDB approach is strongly supported by Oracle, IBM, Informix and Sybase, and all these companies produce some flavour of UDB. Now, just to prove that you're awake, hands up if you've guessed which company takes a contrary view. Let's do a hand count: 1... 2... Oh! All of you guessed.

The OLE DB view

Microsoft has no plans for a UDB offering. Instead, "the big M" argues that it is simply not realistic to expect all data to be stored in an RDBMS and that the typical, fairly crude data stores currently used by software like email packages will persist. So, rather than build a UDB into which you could put all the data but probably won't, Microsoft says let's keep RDBMSs more or less as they are and provide hooks from the RDBMS into other data storage mechanisms. The means of making these connections is the shiny new OLE DB from Microsoft (of course) which that company hopes will rapidly become as ubiquitous as ODBC.

Microsoft's argument skirts the issue that data stored by its own non-relational products brings problems by the barrowload

Which one is right?

The really interesting question is, which approach is "correct"? The answer is that no-one knows; just like the JVC *versus* Betamax debate, this one won't be decided by technical competence but by the way the industry as a whole finally jumps. However, that has never stopped me from voicing my opinions in the past, so here goes.

As a database freak, I wholeheartedly support the UDB concept — no question. However, as a pragmatist I think that Microsoft is ultimately right. I believe that, realistically, there will always be data stored outside the RDBMS ideal, and that people will still want access to that data, so they will surely need OLE DB. Nevertheless, there is an extremely important rider to that viewpoint which strongly suggests that the story is not yet over. We are all aware that the registry in NT is less than perfect. It grows, it bloats, it acquires errors on machines where software is frequently loaded and unloaded. The result is that it is not uncommon for NT to be reloaded at six-monthly intervals on such machines, simply to clean up the registry.

The fundamental problem is simple. The registry is not a proper transactional database — just like the email systems and all the other applications which store data in a loose and slipshod manner. In turn, this means that Microsoft's argument for the continuation of non-relational data stores skirts the issue that data stored by its own non-relational products brings problems by the barrowload. We live in interesting times.

▲ AN (AS YET UNFINISHED) IMAGE BY MODERN ARTIST, STEPHEN BARCLAY. AUTOMATICALLY CLASSIFYING THIS IMAGE IN A MEANINGFUL WAY FOR HUMAN BEINGS IS A CHALLENGE THAT WILL TAX COMPUTER SYSTEMS FOR SOME TIME

PCW CONTACTS

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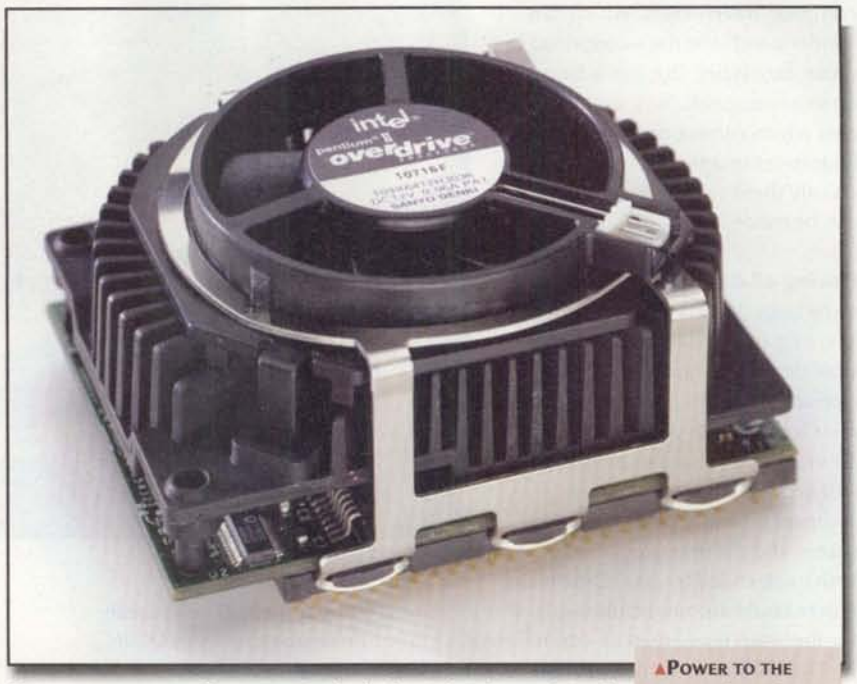
Play it cool

Does your CD-ROM drive need chilling out? Here's how Roger Gann coped when the heat was on.

Sometimes there's a simple solution to an inexplicable hardware problem – so simple that it stares you in the face, defying you to diagnose and spot it. Here's a case in point. My PC at home is a homemade hybrid, enclosed in a mini-tower. It stands on the floor next to my desk and, for the sake of convenience, I located the CD-ROM drive in the topmost drive bay, which makes a lot of sense. The drive was an old 8X LG IDE drive and, to be honest, it didn't get a lot of use. To cut a long story short, the drive had become unreliable, sometimes working, sometimes not, and frequently performing a disappearing trick from the Windows 95 Device Manager list. I deduced that I'd got a duff drive so I popped out to Simply Computers, bought another IDE drive and fitted it. End of problem – or so I thought.



▲POWER TO THE PEOPLE: INTEL'S PENTIUM II OVERDRIVE CHIP

It took a while but eventually the problem of the "disappearing" CD-ROM reappeared. Figuring that it must be a pretty big coincidence getting *two* dud CD-ROM drives, I decided to investigate further. No doubt about it, the drive was 100 percent correctly installed. Eventually I tracked down the cause of my woes: the modem. I use a Microcom V.34 external modem at home and to keep my desk free of clutter I site the modem on top of my mini-tower case, directly over the CD-ROM. When I was playing around with V.90 modems I unplugged the Microcom for a couple of weeks. Miraculously, the CD-ROM drive problems evaporated. How so? It turned out that heat was the problem. Although I turned the PC off when not in use, I left the modem on all the time. As a result, it ran hot and the heat it generated was conducted into the case and thus into the CD-ROM drive, which then got all hot and bothered. Moral of the tale? Keep your CD-ROM drives as far away from any sources of heat, particularly the new breed of super-fast, multi-gigabyte hard disks which produce prodigious amounts of heat. And, keep an open mind when diagnosing faults as things are not always what they seem.

It took a while, but eventually the problem of the 'disappearing' CD-ROM reappeared

Into OverDrive

Intel recently released the long-awaited Pentium II OverDrive. Before you get too carried away, let me explain that this is a Pentium II-based upgrade for the Pentium Pro processor. The Pentium II ODP is available in two versions: one that takes 150 and 180MHz Pentium Pro's to 300MHz, and the other, which takes 166 and 200MHz Pentium Pro's to 333MHz – the fastest processor speed possible on a 66MHz system bus. The Pentium II OverDrive has a suggested list price of around £365, which compares favourably with the retail version of the 333MHz Pentium II.

As well as a faster clock speed, you get several other benefits, too. The guts of the new OverDrive is still the old P6 core, but is now based on a 0.25micron process. You also get MMX extensions plus 512Kb of cache. Unlike the Pentium II cache, which runs at half the processor's core speed, the Pentium II OverDrive's cache runs at full speed. This translates into a performance gain of around six percent over a Pentium II – the iCOMP2.0 rating of a 333MHz PII being 366 against the 333MHz PII OverDrive's 387MHz.

I run Windows NT 4.0 Server on my Pentium Pro machine and the upgrade has made a noticeable difference to the machine's overall responsiveness. Intel's SYSmark32 benchmark posts an overall performance gain of about 50 percent over a 200MHz Pentium Pro running Windows NT 4.0, rising to 75 percent for a 150MHz processor.

It was the Pentium Pro's cache, if you recall, which was the downfall of the processor. It was integrated with the CPU in a single piece of silicon; a process that delivered excellent performance but from which it was difficult to derive good production yields. In short, it was too expensive to manufacture on a large

scale. There was no way of testing the two halves of the processor until it was too late. And if, for example, the cache was a dud, you would have to ditch the whole thing and start again. The Pentium II got around this by decoupling the cache from the processor, putting it on the circuit board to which the processor was attached and running it at a slower speed. As a result, the original Pentium II processors didn't offer significant performance advantages over the Pentium Pro, which remains the processor of choice in heavy-duty server configurations simply because of this and its support for eight-way (and higher) SMP configurations. The 1Mb cache version was particularly sought after.

The PII is limited to dual-processor configurations (as a result, so is this OverDrive) and this restriction won't be overcome until the much-delayed Xeon comes on stream, hence the refusal of the Pentium Pro to take an early bath. This new OverDrive therefore provides a decent mid-life "kick" for single- and dual-processor servers.

Intel stresses that not all Pentium Pro motherboards can take the upgrade and it quietly recommends upgrading your BIOS to the latest version first. It also provides a little diagnostic program (available from Intel's web site) that tells you whether or not it will work with your BIOS. The program was fairly ambiguous when it came to analysing my cheapo Pentium Pro motherboard, but the upgrade nevertheless worked perfectly.

Too hot to handle

As with all processor upgrades, the task takes only a couple of minutes to perform. I had to first unclip the large heatsink (a fiddly process), then unclip the Socket 8 ZIF lever to remove the old processor. I should have worn my oven gloves as both components were too hot to handle. You have to exert some care when inserting the new processor, as the pins are quite delicate.

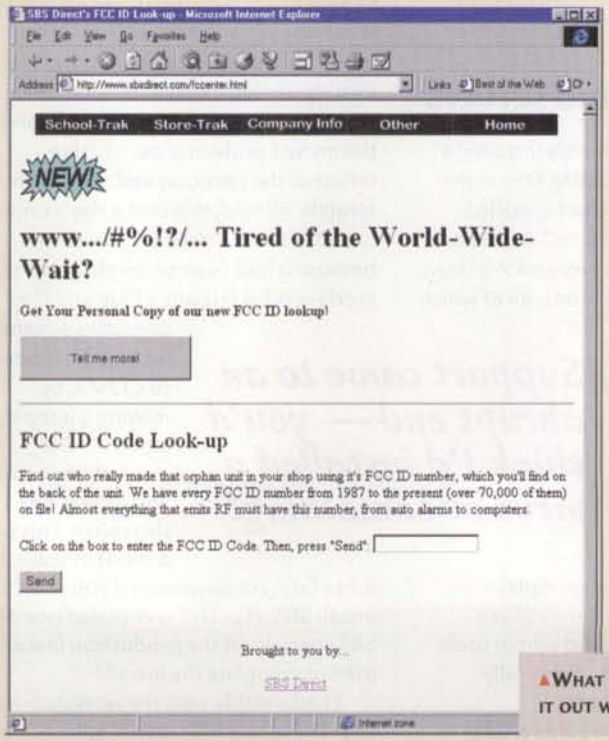
The final step is to connect the power lead to the cooling fan: unlike previous OverDrives, this one doesn't draw power from the fan via the socket but from a power lead using a "Y" adapter provided for the purpose. The Pentium II ODP is a solid piece of kit, and to my mind looks like a powerful processor ought to: big and chunky with lots of heatsink fins. If looks were important, it would knock the somewhat flimsy, plasticky Pentium II into a cocked hat. I have to say I was pleased to find that you do get a decent cooling fan/heatsink with the OverDrive, which is more than essential given the high running temperature of the original

ANONYMOUS HARDWARE

I got an interesting email from reader Simon Allden the other day. It was a follow-up to my September issue column on BIOS upgrades. One problem I had come across was that of identifying the manufacturer of a motherboard: it seems they go to great lengths to leave off any identifying marks or labels.
I suggested one way: that is, using the BIOS ID string, but this isn't foolproof because not all BIOSes (e.g. Phoenix or MR) use this method.

Simon suggests another possible avenue of investigation: "All electrical equipment sold in the USA apparently requires an FCC (Federal Communications Commission) ID to be issued, ensuring compliance with their equipment standards," he writes. "Thus, to find the manufacturer of a piece of electrical equipment, all you need do is fire up a search engine (I was told Yahoo works best for this search), type in the FCC ID as it appears on the piece of equipment (e.g. FCC ID H52PT-3006) and follow the appropriate link."

One useful web site he mentioned was www.sbsdirect.com/fccenter.HTML, a site worth bookmarking. This lets you enter the FCC ID and then performs a lookup on its database of manufacturers. I entered CJE-0159 and it correctly identified it as a US Robotics serial card made in 1992. Simon also mentions using Yahoo to perform the search, but I prefer to do my net-searching with an excellent piece of freeware called WebFerret, which hits multiple search engines simultaneously and collates and de-dupes the results, which you can then sort. If you click on a search hit, your browser fires up and takes you there. You can download WebFerret and other equally good search tools from www.ferretsoft.com.



▲ WHAT IS THAT KIT? CHECK IT OUT WITH THE FCC

Pentium Pro. I've always found the add-on cooling fans you can buy for around a fiver are really low-quality plastic jobs with a life-span that makes a butterfly look like the epitome of longevity.

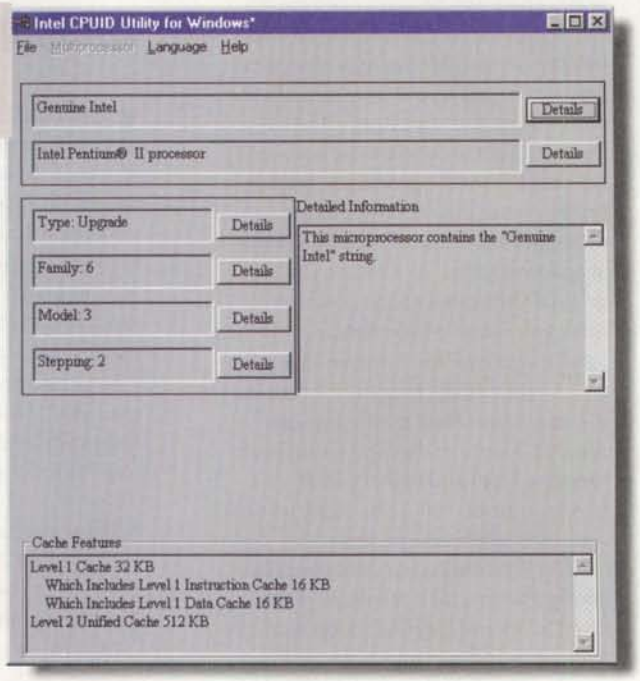
Cooling the old Pentium Pro used to be a perennial problem at Gann Towers but this doesn't arise with the Pentium II OverDrive. The fans Intel specifies for its OverDrive processors are very good. They're made of metal, look "heavy duty" and seem to last forever.

Incidentally, Intel has posted a little utility on its web site to help you identify what sort of Intel CPU you've got fitted. Called, rather unsurprisingly, CPUID, it is available in both DOS and Windows versions. This 126Kb download detects and lists such details as Family, Model and Stepping, although it neither detects clock speed nor the multiplier effect, which is a shame. And when you try it on a PC without an "Intel Inside" it simply declares "unable to identify". Download CPUID from www.intel.com/design/perftool/cpuid/utility.htm.

Of support and servers

Talking of servers, I recently installed a network for a small trading firm in the City area of London. I had specified Microsoft BackOffice Small Business Server (SBS) for the server and Windows NT 4.0 for the workstations, all of which was bought from Dell. SBS is a good choice for a small business as it encompasses Windows NT 4.0 Server together with most of Microsoft BackOffice at a knock-down price. For example, SQL Server, Exchange Server plus a whole raft of goodies and admin tools designed for the small, technically unsophisticated business.

The server was a Dell PowerEdge 2200, which comes "oven-ready" for SBS. In theory, you should be able to simply turn on the server and the SBS install should complete with minimal intervention required. Well, that's the theory. One of the key pieces of hardware SBS sensibly insists on is a modem, and the install won't complete unless it finds one. Naturally, the Dell PowerEdge SBS bundle includes a modem, an internal US Robotics V.34 Sportster. Needless to say, the SBS install routine couldn't detect the modem as it should have. As a result, it completely messed up the install because the absent modem caused a domino effect throughout the system, crippling RAS, Exchange Server and so on. I take the conservative view with server software installs that it has to go totally perfectly, otherwise it's a failure. This proved a costly failure as reinstallation over the existing dented installation (the Dell recommended solution) didn't resolve the myriad problems. So, I had to reformat the partition and start from scratch. All told, this cost a day's time.



▸AVAILABLE FOR WINDOWS OR DOS, CPUID WILL IDENTIFY YOUR CPU

SBS failed to detect the modem because it had been set to plug-and-play mode – NT 4.0 is not a Plug and Play operating system. Setting the modem to COM3, by moving a jumper, cured it. SBS correctly detected it and all was fine thereafter. This was a trivial mistake, but it has fatal consequences if you want to install SBS. Has Dell ever pulled one of its SBS specials off the production line and tried to complete the install?

Support came to an abrupt end — you'd think I'd installed a virus or something!

I had trouble with the workstations, too. These had 9Gb drives, split as a 2Gb FAT16 partition with the balance as a 9Gb NTFS partition. NTFS is awkward from a production point of view and it's often more convenient to "blow" operating systems onto a blank hard disk if FAT16 is used. Unusually, the Convert utility, which converts partitions to NTFS, had been added to the Program menus and so I ran the convert utility because I wanted the advantages of the NT File System. The problem was that shortly afterwards, the workstations in question refused to boot: the POST would successfully complete, but OS Loader just wouldn't kick in. A phone call to Dell support established that this was either a software or configuration issue. Because I'd converted the partition to NTFS, Dell would not offer further support. If my problem had been with Drive D: which was factory shipped as NTFS then support would have been forthcoming. But as Drive C: was no longer in the same condition as when it left the factory, support came to an abrupt end – you'd think I'd installed a virus or something!

There had been no warning about taking this clearly risky step and it seems absurd to offer support on one NTFS partition but not another. It speaks volumes about the company's faith in the operating system. Don't say you haven't been warned. Read the terms and conditions very carefully before installing any software onto your new PC. You may find that it will invalidate your warranty.

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MARKETING THAT'S MORE DIRECT

Christmas chords

Here's something to keep you amused over the festive season. Steven Helstrip presents a selection of the finest shareware virtual studios for making music with your PC.

Over the past year we have seen some exciting developments in sound technology, perhaps most notably the virtual studio. Cubase VST certainly started something big; within 12 months of its release there were around 100 virtual effects which could connect to your virtual sound studio with virtual leads. Then came the wave of virtual synthesisers and virtual samplers. It came as no big surprise that these could connect to your virtual studio with virtual MIDI interfaces.

Five years from now, professional studios will exist purely to record orchestral, folk and rock music. Pop, dance and the remaining electronic genres will be recorded at home or, at best, in project studios driven by software. There simply won't be the need for expensive DSP and valve hardware; it will all be modelled in software.

Even the sound engineer is under threat. On page 286 we take a look at a new plug-in from Steinberg that can learn the sonic characteristics of a platinum-selling album and apply it to your own bedroom recordings. Whatever next?

Festive fun

As it is coming up to Christmas, we are going to look at the five best shareware virtual studios for making music with your PC. It's a mixed bag of synths, samplers and utilities so there should be something here to keep you entertained over the festive season.

AWE Toy

If you've got an AWE sound card, you can't afford to be without AWE Toy [Fig 1]. It provides access to all the card's synth, SoundFont and audio parameters via nine panels. MIDI processors include an arpeggiator, pseudo echo and a chord generator, all of which can be routed to your sequencer to record performance data in real time. There's support for virtual SoundFonts and setups can be saved on a per-song basis. Available for free download at www.maz-sound.com.

[FIG 1]

Hubi's LoopBack Device

If you want to control software-based MIDI applications from your sequencer, you're going to need a virtual MIDI interface. Hubi's LoopBack Device provides up to four MIDI ins and outs. It's a doddle to set up and rates highly as one of my most useful utilities. It's available for free download at www.maz-sound.com.

[FIG 3]

Signum 1100DX

Here's an Akai S1100 sampler in software [Fig 2]. The entire operating system has been implemented, right down to sample editing, and there's even support for VST and DirectX plug-ins. Sample banks, or programs, can be created by simply importing a wave file and assigning a MIDI channel to it. With more features than a Swiss army knife and support for multiple sound cards, we'll be seeing a lot more of this in 1999. www.signum.it/1100/1100.htm.

[FIG 2]

Trancemitter

Trancemitter [Fig 3] is a free VST filter module. What makes it interesting is that its frequency cut-off parameter can be triggered by the level of the input signal, making it similar to an auto-wah effect. There are parameters for resonance, LFO rate and level tracking. As more applications are supporting VST plugs, everyone should have a copy. www.steinberg.de.

VAZ

VAZ [Fig 4, p286] is a virtual analogue synth based on the classic Arp Odyssey. It comes with over 180 synth patches to start you off and has very low latency (typically 20-40ms). The noises that emanate from this software are massive,

Questions & answers

Q Thanks for the great Sound pages in *PCW*. I have a question regarding PC-based recording and would be grateful if you could help, as I've been given a lot of conflicting advice and need someone with a similar perspective. I'm a keyboard player looking to purchase a new PC for recording and sequencing work. I need to be able to record and simultaneously playback eight audio tracks through an Event Gina sound card. I've been given to understand (by a PC supplier) that with this level of recording, SCSI data storage is the only way to go. Is this true? The new Ultra DMA drives also offer fast data transfer. I have budgeted for the extra cost of two 4.0Gb SCSI drives and an Adaptec controller card. Can you tell me if I'm wasting my money? The additional cost is approximately £650 over an equivalent UDMA-equipped PC, which could pay for some quality mics and a pre-amp instead. I would also be using software effects on a number of tracks. The basic system is a PII400MHz with 128Mb of RAM.

GEORGE BRITTON

...two 4.0Gb SCSI drives and an Adaptec controller card. Am I wasting my money?

A *I'm happily running Cubase VST on a 266MHz PII equipped with a Gina card. With my UDMA hard disk I can playback 12 tracks simultaneously without a hint of glitching. This leaves plenty of headroom for software-based effects: I usually have a couple of compressors, a delay and a reverb on hand. SCSI drives generally outperform IDE drives, providing faster access and transfer rates. However, playback of eight audio tracks only requires 1.2Mb of data to be read from the disk per second. Under perfect conditions, UDMA drives can deliver up to 33Mb per second. If you're able to dedicate two UDMA drives to audio files, you're unlikely to encounter any problems.*

Q I use a lot of samples in my music and recently got hold of a copy of CD-DA to allow me to digitally extract audio from CDs. My problem is that whenever I put an audio CD into the drive, the disc starts to play automatically. This is quite irritating, as I have to stop and close the Media Player before I can carry on. I know there's a way to turn off this feature but I don't know how. Can you help?

ANDREW HUNDLEY

A *There are two ways around this problem. You can either hold down shift when closing the CD tray, or a more permanent solution is to disable Windows' Auto Insert Notification. To do this, open the Control Panel and load System. In the Device Manager section, select the CD-ROM setting and double-click on your drive to open the Properties dialog. Auto Insert Notification can be found in the Settings tab.*

ranging from Prophet-like pads to faithful 303 basses. You've got to try this to believe it. Available for free download at www.software-technology.com.

Steinberg FreeFilter

If you want your music to sound as good as the CDs you buy, FreeFilter could help you on your way. It's a DirectX plug-in that can learn the sound of one piece of music, then cunningly apply it to another. So, for example, you can take a song that you feel has been well mixed and EQ'ed, let FreeFilter analyse its frequency content, then adapt its EQ settings to your own mix. Put simply, it's a virtual engineer that can add a touch of sparkle to home-made recordings. The 30-band EQ can operate like any other graphic equaliser to provide up to 15dB of gain and cut. The fun doesn't start, though, until you have a two-track mix of a tune that needs a hint of spice. To analyse a platinum-selling single, all you have to do is enable the Source button and play the wav file from your audio editor. FreeFilter then creates a "fingerprint" of its frequency content [Fig 5]. Before applying the settings to the destination file, you must first allow the plug-in to learn its frequency content, which is effectively the same process.

Then comes the fun bit: click the Match button and allow your track to be transformed. All this happens in real time and you can set the strength of the modification from zero to 200 percent. Of course, there's a great deal more to a good mix than just EQ, but given the right source material with which to work, FreeFilter can work magic. It's a bit pricey at £299 (inc VAT) but this is a product that delivers professional results.

• Arbiter Audio is on 0181 207 5050.

▶ FREEFILTER, THE IMPRESSIVE PHONIC PHOTOCOPIER

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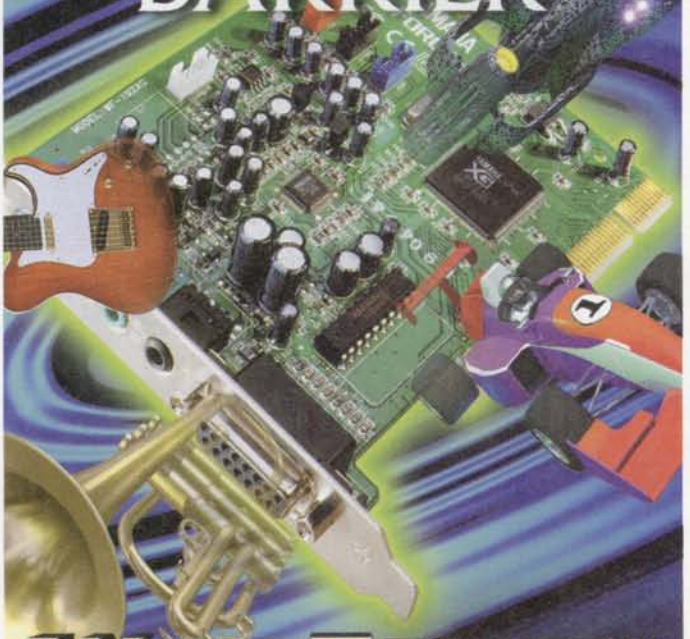

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Gloria in Extensis

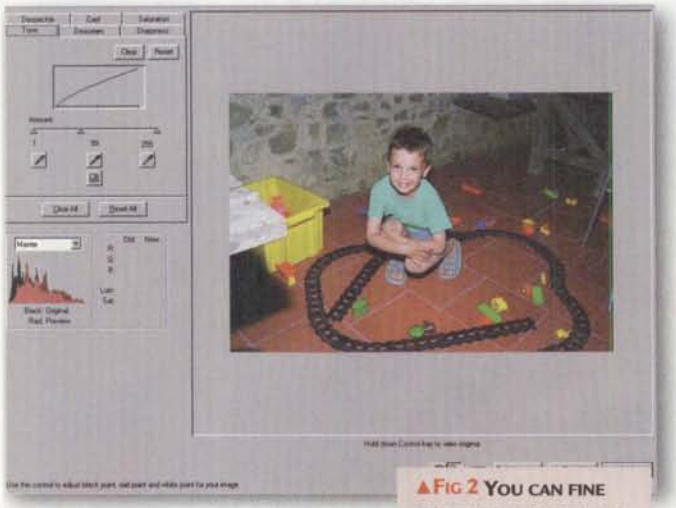
Extensis Intellihance is heavenly for improving your images. Ken McMahon sings its praises.

It's more than a year since I took stock of the myriad plug-ins available for image editors. They're generally referred to as Photoshop plug-ins but you can use them with any application which supports Adobe's plug-in architecture. This month, though, I want to concentrate on one that's earned its keep many times over in the past year, and that's Extensis Intellihance.

Intellihance is a multi-faceted plug-in which improves your images by first evaluating them, then making adjustments to the contrast, brightness and saturation, and applying sharpness and despeckle filters. You can alter the settings to reflect your own personal preference and save the alterations as presets. Say, for instance, that images grabbed from your camcorder always had a particular colour cast and grainy-looking shadow areas, you could optimise Intellihance's preferences and save them as a preset to be used when processing video images. Used in combination with an image editor which supports scripting or batch processing, Intellihance becomes just about the quickest and easiest way to bring your images up to scratch.

Intellihance becomes just about the quickest and easiest way to bring your images up to scratch

When you select Intellihance from the plug-in filters menu of your application, you are presented with a not very impressive dialog box with three buttons: enhance image, preferences and cancel. The enhance image button does what it says. Using the default settings you can give it a try, but you'll do better to press the preferences button which gives you more of a hand in the process. The preferences dialog is shown in Fig 1. This is one of a series of pictures I took outside at night, with a flash mounted on the camera. Inevitably, the highlights in the foreground are a little burned out and the illumination falls off rapidly (in inverse proportion to the square of the distance, for all you technical types) resulting in some very dense shadows. Using the default settings, Intellihance has done a pretty good job of bringing some detail back into the shadow areas. The "before" version can be viewed in the preview window by pressing Control. The highlights are still looking harsh, though, and the contrast is way too high, probably not helped by Intellihance's bucketload approach to unsharp masking. So there's still plenty we can do with this image.



▲Fig 2 You can fine tune adjustments but regrettably all the fine tuning in the world cannot be saved as part of a preset

Before you start, it's probably worthwhile selecting Preferences from the "display at launch" pulldown so you come straight here next time you select Intellihance from the plug-in's menu. Another thing worth doing right away is maximising the window to full-screen. Oh, and I should have told you to make sure that you crop your picture nice and tight, as any areas of white or any flat colour around the edges will throw Intellihance off the scent.

In the top left of Fig 1, you can see pulldown menus from which you can select presets for all the adjustments. The contrast pulldown has seven options, ranging from Off to Hard, Snappy, Flatten Highlights and Flatten Shadows. Soft seems to do the trick well with this kind of image. The saturation presets range from Low to High with a few in-between settings: all increase the saturation of the original, and changing

◄Fig 1 Intellihance provides a nice big preview window so you can see exactly what's going on. Press control to revert to the pre-adjusted image. The black and red areas on the histogram indicate pre- and post-adjusted levels respectively

Questions & answers

Q I want to have the letters USA filled with stars and stripes clipart. How could I do it? I have Microsoft Publisher 97, CorelDraw 3, SerifDraw Plus 2 and Pageplus 3, yet no matter what I try, it doesn't seem to register the clipart. I have tried everything to achieve this but nothing seems to work. What I had to settle for in the end was a stars and stripes flag placed behind the text with a clear fill colour.

MICHAEL PHOENIX

a *My advice is to upgrade to CorelDraw 7 which, in the form of Powerclips, provides exactly what you need. Here's how to create text filled with the stars and stripes flag. First, create the USA text by clicking in the draw window to create artistic rather than paragraph text. Set the text using the font and size pulldown (I've used 200pt Arial Black). Next, import the flag from the Corel clipart CD, which contains just about every flag ever flown, including semaphore flags and the skull and crossbones. With the flag still selected, choose "Powerclip — place inside container" from the effects menu, then click on the USA text. You can position the flag artwork within the text by selecting Edit Contents from the same menu.*

▲Fig 3 WRITE PATRIOTIC LETTERS IN CORELDRAW 7, COURTESY OF POWERCLIPS. THE CONTENT, THE US FLAG, CAN BE POSITIONED ACCURATELY USING EDIT CONTENTS

it from medium to low will tone things down without losing colour from the skin tones. The sharpness settings, like the others, increase the overall sharpness of the image. The lowest setting is Soft, but don't expect it to soften or blur the images: it just sharpens things up by a soft degree. Because it's so contrasty I don't think this image, nor others like it, will benefit from sharpness, so I'm turning it off. Bear in mind that you're trying to optimise these settings, not just for this one image but for all of the images you're going to process using these presets. The next thing to do is save the preset; I've called it "night flash".

Fine tuning

If you want more control than the pulldown settings provide, hit the Fine Tune button at the bottom of the preview window. Fine-tuning adjustments can be made manually only to individual images: you can't save the adjustments as part of a preset [Fig2]. This replaces the pulldowns with a tabbed palette, giving greater control over each of the image adjustments.

Instead of a few presets you get access to sliders and other tools which provide an infinitely variable degree of control. Using the tone panel I've put detail back into the highlights by bringing the highlight slider back up to 255 and lightened up the midtones using the midtone slider. There are three eyedropper tools you can use to set the white, black and midtone points from the image, and a lightmeter which you can use to select an area of the image on which to concentrate when making tonal adjustments. The final adjustment I've made is to fine tune the cast in order to remove the green tinge that's crept into the wall.

There really isn't too much wrong with this image to start with, but by using Intellihance I've managed to make real improvements in no time at all. What's more, other similar images on which I've tried these settings all benefit from similar improvements, in some cases bringing out background detail that previously was not visible.

COLOUR MANAGEMENT CUES

Following the Colour Management workshop in the September issue, a number of you wrote in to ask for further information about ICC-compliant colour management systems.

There seem to be relatively few books on the subject, although I can wholeheartedly recommend Agfa's *The Secrets of Colour Management* which you can order online from www.agfahome.com/publications/dcp5text.html. Chapters include: The Digital Reproduction Workflow; What Is Light?; How Do We Perceive Colour?; Why Colour Management?; Monitor Limitations; Characterizing Output Devices; Colour Separation; and Colour Management Today.

There is also an Agfa colour management FAQ at www.agfahome.com/faqs/colormgmt.html, although this is rather heavily Agfa-product biased.

Other useful web resources include:

- The International Colour Consortium at www.color.org which has good links to most of the relevant sites.
- Try www.apple.com/colorsync/index.html for details of Apple's ColorSync CMS.
- And at www.adobe.com/supportservice/custsupport/TECHGUIDE/PSHOP/CMS3/cms_gen.html you can find Adobe's excellent and comprehensive technical guide to colour management.

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Changing rooms

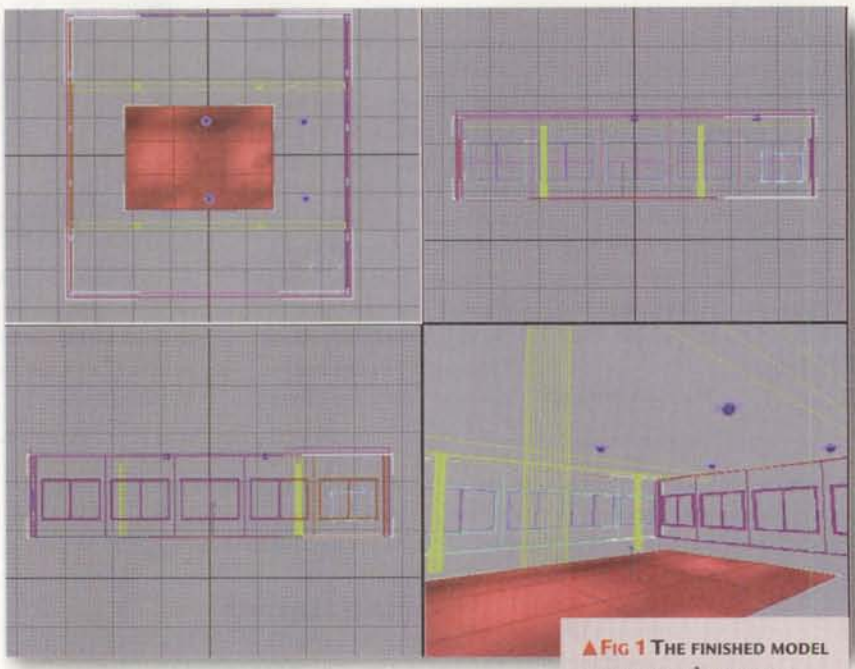
You can use 3D graphics to try out room plan and decoration ideas. Benjamin Woolley explains.

A DIY enthusiast and amateur interior designer who was always rather puzzled by my preference for fiddling around with virtual spaces rather than real ones, recently pointed out to me that one useful application of 3D graphics would be to model room interiors and then use the result to test out various décors and colour schemes. I have just spent the past few days trying to do exactly that, discovering along the way some salutary lessons about the difficulties of using a computer to simulate physical environments.

Light fantastic

The first stage of the task was relatively easy to fulfil: build up a model of the interior to be designed. The space, a warehouse conversion, is a relatively simple one, little more than a flattened cube [Fig 1]. The only architectural flourishes are the cast-iron pillars, which hold up two heavy beams that traverse the ceiling, and some light fittings.

Once the basic model was complete, I next had to consider how best to light it. This provided the first big challenge, as lighting a virtual scene that is supposed to correspond with a physical one is a tricky business. The problem is to do with both the nature of virtual lights, and the accuracy of renderers. Virtual lights do not necessarily behave exactly like real ones. For example, in my scene there is a soft "omni" (as in omni-directional) beneath the room, the light from which actually penetrates the underside of the floor before it hits the ceiling. The reason I have put it there is to make up for another peculiarity of virtual lighting: there is a set of spotlights in the ceiling which cast quite intense pools of light onto the floor, but due to the inadequacies of the general-purpose renderers you get with 3D authoring packages, the light is not reflected back into the room. So, even when the spots are pointing at a shiny parquet floor, the rest of the room remains in gloom. I have had to use the omni to compensate.



▲ Fig 1 The finished model of the room's interior. The large red oblong object is the plane upon which the rug has been mapped

There is a third light in the scene, which represents the sun. It is a so-called (in 3D Studio MAX) "direct" light which casts its light in parallel beams and, unlike a standard omni, casts shadows (i.e. the light is blocked by opaque objects in its path). By moving the sun around the model, I can reproduce the different lighting conditions the room's inhabitants will experience at different times of the day, and by switching it off I can give an idea of what the artificial lighting will achieve at night time.

Virtual lights do not necessarily behave exactly like real ones

With the modelling and lighting completed, I was now ready to start on the décor. This, for my DIY friend, is the whole point of the exercise. Once you have got a rough model of the space to be decorated, you can experiment with different schemes simply by changing or editing textures. For example, the pillars and beams are textured with a mottled cast-iron finish which happens to be black. By simply altering the diffuse colour properties for that material, it can instantly become white, blue, purple or whatever you want, while retaining its distinctive texture. You can instantly repaint the walls a different colour using the same technique. When you start to apply texture maps as well as colours, a whole host of new possibilities arises. The parquet flooring can be changed to stone or marble. It can be rendered as highly polished or dull, bumpy or smooth, simply by changing the appropriate parameters in the materials editor.

The final rendering of the scene [Fig 2] shows how you can even try out artefacts you have spotted in a catalogue. The rug, called a "Gabbeh", is a form of tribal weave from southern Iran. For my virtual rug, I scanned a beautifully-printed colour picture from a catalogue, using a

◄FIG 2 THE RENDERED RESULT OF THE MODEL, WITH A SHINY PARQUET FLOOR AND WALLS PAINTED A TASTEFUL SHADE OF BLUE. I HAVE USED A POST-PRODUCTION EFFECT TO ADD SOME GLOW TO THE LIGHTS

flatbed scanner, and applied the resulting bitmap as a texture map to a simple flat plane (that is, a square) placed just above the floor. The rug did present one problem: it was not a perfectly rectilinear shape and its edges were softened by fringes. If I mapped it on to the plane without taking this into account, I would end up with hard, cropped edges; to avoid this, I used a 2D paint package to create a mask out of the rug, using the alpha channel (*see the December '97 column for more on this topic*). This mask was then used as an opacity map, making the areas around the edges, and even between the tassels, transparent so that the floor beneath would show through.

When I had finished texturing, I was able to render endless versions of the room, each with a different wall or floor covering: some with terracotta tiles, others with stripy wallpaper, and so on. The result was very pleasing, and provided a reasonably good indication of which colour and pattern schemes would work, and those that would not.

There are specialist software packages for using 3D graphics to plan room interiors (notably Visual Home, from Fasttrak) but only by doing it yourself with a proper 3D authoring package will you get the flexibility to see what is possible, as well as discovering the limitations. This exercise provides a reminder of just how unrealistic so-called photorealistic renderers remain. In particular, the way light behaves in a virtual scene is different to the way it behaves in a real one, in a way that is of particular relevance to trying to reproduce interiors.

If I had, say, a bright red floor and pure white walls, none of the red light reflected off the floor would be reflected by the wall. Furthermore, the overall level of brightness of the room would remain the same whether you use light or dark colours. The only way around this is to add, as I have done, false lighting and tint it appropriately. Unfortunately, the more you do this, the less reliable your virtual room becomes as a guide to what the real one will eventually look like.

A STANDARD CHRISTMAS WISH

In the time-warped world of monthly magazines, this January issue comes out before Christmas. So, I have only one thing to ask of Santa: a standardised, extensible 3D file format/rendering language – although if he could throw in a workstation with an Intel Xeon processor, it would be appreciated. A "standard" hardly sounds like the most scintillating present, but it really would be a boon to the world of 3D graphics which remains obstinately stuck with a series of proprietary and incompatible standards. There is DXF, but that remains woefully inadequate as it does not allow for textures. There is VRML, but that is specifically designed for 3D content which is going to be sent over the internet and rendered in real time. An industry-approved format would allow us to pick and choose different software tools from different suppliers. It would mean that, for example, you could use a texture editor from one company with a renderer from another. We would no longer have to rely on one monster package to provide everything we wanted. What a real gift that would be to us all.

PCW CONTACTS

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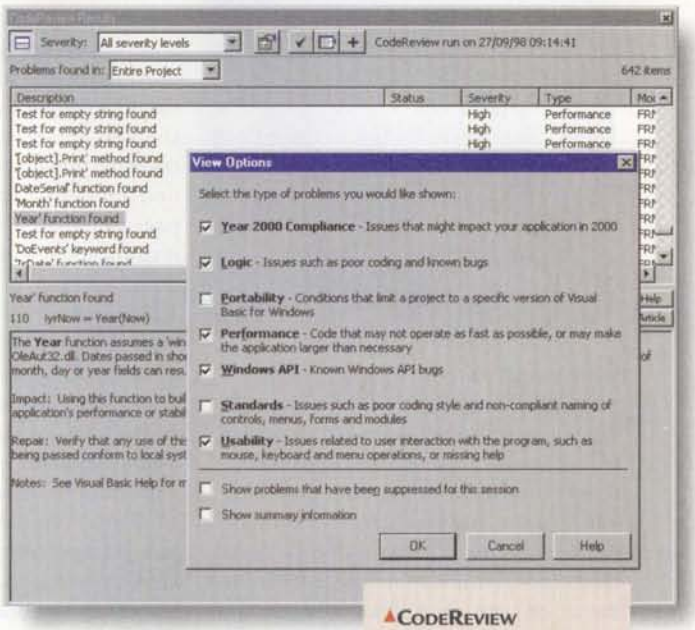
Bugging out

It's easy to catch program bugs and streamline your code in Visual Basic, says Tim Anderson.

Congratulations to NuMega and Compuware, who have shipped DevPartner Studio for Visual Studio 6.0 almost before Microsoft's product hit the shelves. Visual Studio itself has an array of debugging facilities, but DevPartner Studio goes several steps further. A number of development tools are supported, but the main focus is on Visual C++ and Visual Basic.

Smart move

I tried out the VB tools on a project I knew to be of poor quality. A club membership database, it was ported from VB 3.0 to VB 6.0 with minimal changes. First, I tried out SmartCheck. If you run an application with SmartCheck enabled, then it will catch unhandled errors before VB's own error dialogue appears. The SmartCheck error dialogue is more informative than VB's default, particularly with ActiveX and API problems. When you exit the application, you can view a report of all your application's events, with a synchronised view of the source code, making it easier to trace why the error occurred. SmartCheck will also test compliance with different versions of Windows. Alongside SmartCheck, DevPartner studio includes FailSafe. This automatically adds error handlers throughout a project, the aim being to make the code uncrashable. Whereas an unhandled error in VB will normally terminate the application, Failsafe will pop-up a printable dialogue explaining the error and inviting you to describe what you did to cause it. The problem with FailSafe is that it only catches code that raises an error, whereas many bugs are logic errors that deliver wrong results without actually crashing the application. If you are suffering from crashes though, FailSafe may well help.



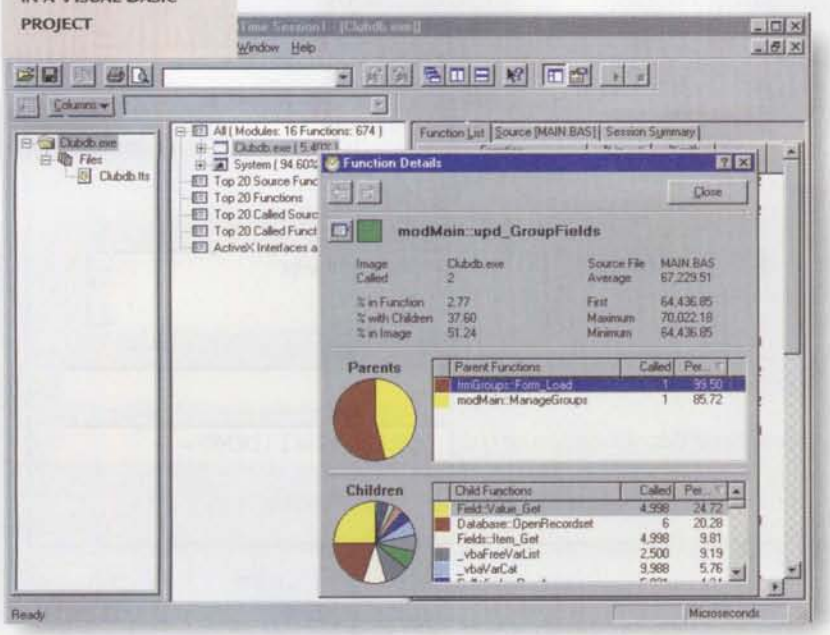
▲CODEREVIEW RUTHLESSLY EXAMINES YOUR CODE FOR POTENTIAL PROBLEMS

Next, I tried Code Review, which analyses your code and compares it against a database of rules. Code Review made 1,500 comments on my modest application. For example, it picked up use of the Global keyword, pointing out that Public should be used instead as Global may not be supported in future versions.

A few of the comments were more illuminating. Where there was a test for an empty string, it noted that testing for Len(strSomeString) <> 0 could be 150% faster. Where the Print method was used, it noted that the API call TextOut was often 450% faster. It found variables declared but not used, controls with no help assigned, objects created but not explicitly freed, and potential Year 2000 problems. The project quality would be significantly improved by addressing all these points.

Then I tried TrueTime. Like FailSafe, this involves building an instrumented version of your application. Run the application, and TrueTime analyses the performance. In a nutshell, TrueTime tells you exactly how long the application

▼ANALYSING A TIME-CONSUMING FUNCTION IN A VISUAL BASIC PROJECT



◂CORBA 3 BY REAZ HOQUE IS A GOOD INTRODUCTION

spent in each function.
Most functions call other functions, so TrueTime lets you drill down to see what really took the time. A TrueTime session report contains a huge amount of information, and you can view results at API level as well as in terms of your Visual Basic code. I found that only 5.4% of the execution time was running VB code; the rest was in system calls. I was also able to see which functions took up most execution time, how many times they were called, and how the time broke down between child functions. TrueTime is brilliant, and as a bonus will show you how VB works.

Learning Delphi 4

Delphi is a superb product, but very poorly documented. It is as if Inprise likes to tease developers by packing in some great features but not letting on how to use them. For example, try looking up TControlBar in the new Developer's Guide. It isn't mentioned, as far as I can see. There is an online help entry, in the usual terse style without any examples, and that's all. A TControlBar is what you would use to dock several floating toolbars on one site, in the style of Delphi's own interface. If you try to do serious work with dockable controls, you will find that it is not altogether a trivial process and good documentation would be a great help.

Another problem area is CORBA, which is new in Delphi 4 and a key feature. Try to use it, though, and you will find the documentation hopelessly inadequate. To make matters worse, there aren't many good Delphi books around. Recently published is the *Delphi 4 Developer's Guide* by Steve Teixeira and Xavier Pacheco. This is an unusual book, in that some of the chapters are not printed but are provided on the supplied CD. You can easily be caught out, because the missing chapters are listed in the table of contents but all you find printed is a one-page summary. This is strange, but you do still get over 1,100 pages of intermediate-to-advanced Delphi information. There is a lot of useful material here, but the authors do seem to be infected with the Delphi 4 malaise in that several important topics are just not covered at all. If you want to learn about Action lists, docking controls or CORBA applications, you will have to look elsewhere. The book is still well worth having, with valuable material on topics including the Windows API, COM and ActiveX programming, and component programming. But this is not a quick route to learning Delphi 4's new features.

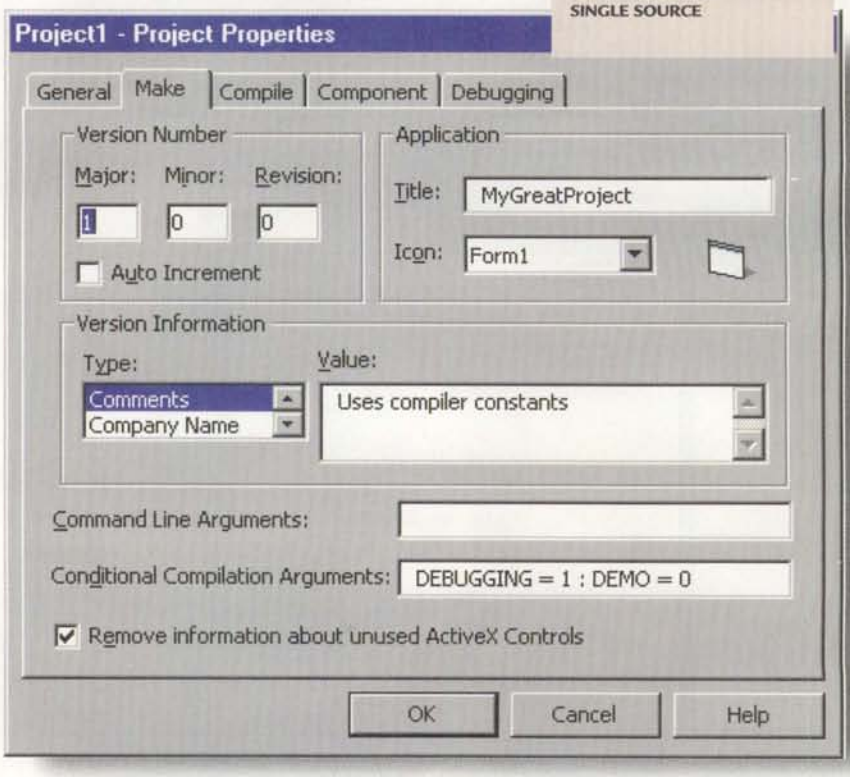
Delphi is a superb product, but very poorly documented

For the time being, Delphi developers who want to work with CORBA will have to turn to more general titles. One recent publication is *CORBA 3*, a developer's guide by Reaz Hoque. Although it is aimed at C++ and Java developers, this title provides an excellent overview of what CORBA is and how it works. Beginning with an architectural overview, it goes on to describe a simple CORBA application in detail. Topics in other chapters include CORBA services, Interface Definition Language, and Object Oriented databases. With a good book like this, plus what little documentation there is supplied with Delphi, you have some chance of making sense of Delphi's CORBA features.

Beginner's corner

One of the more mysterious topics for newcomers to programming is the compiler directive. Most languages have this feature, including Visual Basic since version 4.0. The relevant VB

▾USE COMPILER CONSTANTS IN VB TO CREATE DIFFERENT EXECUTABLES FROM A SINGLE SOURCE



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Questions & answers

Q I have Microsoft Visual Basic 4.0 Pro, and I would like to know how I can create my own metafile from scratch (in code) and save it as a standard .wmf file.

STEPHEN HOLLY

A ***Windows has several API functions for dealing with metafiles. In principle, a metafile is a set of Windows drawing commands saved to disk. The function CreateMetaFile creates a WMF compatible with Windows 3.1, while CreateEnhMetaFile creates an improved metafile that only works on Windows 95 or NT. You can use both from VB, but for success you will need a detailed knowledge of how Windows draws graphics. Daniel Appleman's classic book, Visual Basic Programmer's Guide to the Windows API, includes an example drawing application which loads and saves metafiles, and this would be a great place to start.***

Q I am trying to write a script that runs under NT Server to create a new user account. I would need to call an API, but can find no documentation on Windows APIs pertaining to NT and account administration.

MARK WILKES

A ***The NetWorking API is the one you want, and it is documented in the Platform SDK. You can find it on the MSDN (Microsoft Developer Network) CDs that come with most development products or by subscription. Unfortunately, while the Windows Scripting Host WshNetwork object deals very well with things like mapping network drives or printers, adding a user account is beyond its scope. It will be easier when the Active Directory is available, in Windows NT 5.0, since this has an automation interface that includes methods for creating new users.***

Q I have often had to use a DOS batch file to automate some processes in Windows 95, but there does not seem to be any obvious way of launching Windows or DOS applications from within VB Script. In VBA version 3 and up, you can use the Shell command, but it is not available in VB Script. Am I missing something here?

JOHN LONGBOTTOM

A ***Several readers have written in with similar queries. You need to use COM automation. This code runs the CD Player:***

```
Set WshShell
=Wscript.CreateObject
("Wscript.Shell")
WshShell.Run
("CDPLAYER.EXE")
```

The scripting host exposes a number of objects, providing most of the functionality of the old batch files, for manipulating files and connecting network drives. It is a new approach if you are used to batch files, but useful since many Windows applications are programmable through COM automation. You can create your own automation servers with the full version of VB, and program the scripting host's objects from VB apps.

statement is #IF ... #ELSE ... #END IF. In Delphi it is {$IFDEF}, and in C++, #ifdef. It works in a similar way to the standard IF ... END IF, but with important differences. The conditional expression has to be based on a specially declared compiler constant, and the part that is not executed is not even compiled. In other words, the #IF statement is not represented in the final executable at all.

There are two ways to use compiler directives in Visual Basic. The main technique is to use the box called Conditional Compiler Arguments in the Project Properties dialog. Constants you define here are global. The other method is to put a #Const declaration in your code. These declarations are private to the module they are in – you can override a global directive just for that particular module. Normally, the only values you need give a compiler constant is 0 or 1. VB will not accept non-integer values for global compiler constants, and any non-zero value counts as true.

So what is the point of them? One common use is for debugging. Typically, you want additional checks and tests during development, which you strip out to make code more efficient for deployment. With a compiler directive, all you need do is to place your debugging code within a #IF DEBUGGING block. (In most languages, you would use DEBUG, but in VB that conflicts with the Debug object.) When you come to deploy, all you need do is to remove the #Const DEBUGGING declaration, or set it to 0, and do your final build.

Here are some other handy uses for compiler directives:

- Use a DEMO constant to disable key features so you can put a demo version of your application on the internet.
- Use a BETA constant to add beta-specific code like a time-out after a certain date.
- Use the built-in WIN16, WIN32 and MAC constants to create platform-specific code.
- Perhaps you are considering switching from one grid control to another. You want to run with the new grid, but preserve the code that works with the old one. Define a NEWGRID constant to do just that.

Despite their advantages, some developers refuse to use compiler directives. The truth is, they are inherently dangerous. Effectively, you are testing a different version of the software than the one that gets released. The problem is even worse if you use multiple directives in the same project. Use or refuse? The decision is yours, but personally I would not want to be without them. Just take care now.

PCW CONTACTS

Tim Anderson *welcomes your queries and tips. He can be contacted c/o the PCW editorial office (address, p10) or email* visual@pcw.co.uk.

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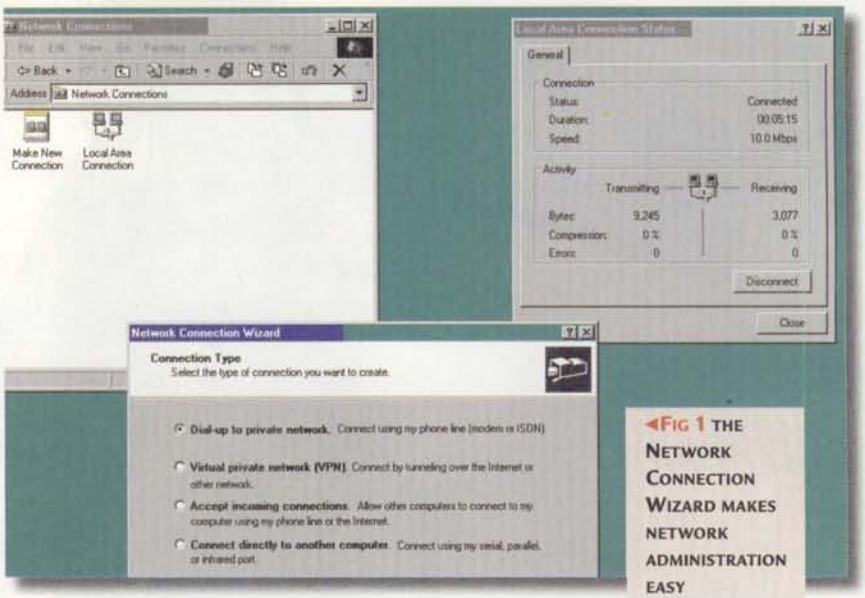
NOS news is good news

We may get Microsoft's new NT 5.0 Beta 3 earlier than expected. Bob Walder reviews the promised new features, based on Beta 2.

With new shipping dates for Microsoft's NT 5.0 network operating system (NOS), I thought I would take a look at some of the promised features (based on what is in the current Beta 2 version). Given the nature of the NOS (to connect devices together) I am amazed how difficult it is to perform this most basic of tasks.

With NT 5.0, the introduction of the Network Connection Wizard allows NT Workstation users to take some of the pain out of the process. Running the Wizard [Fig 1] provides a number of straightforward options including simple dialup, creation of a Virtual Private Network (VPN) link, or connecting directly to another computer via a serial cable or infra-red link.

Higher performance is evident in the networking and communications area with faster stacks and support for Gigabit media, ATM and DSL. Quality of Service support is included, with parameters set and enforced via Active Directory. Standards-based security is in evidence, too [Fig 2] with support for PPTP, IPSec and L2TP. Active Directory also provides us with policy-controlled security, with system-enforced encryption.



◄FIG 1 THE NETWORK CONNECTION WIZARD MAKES NETWORK ADMINISTRATION EASY

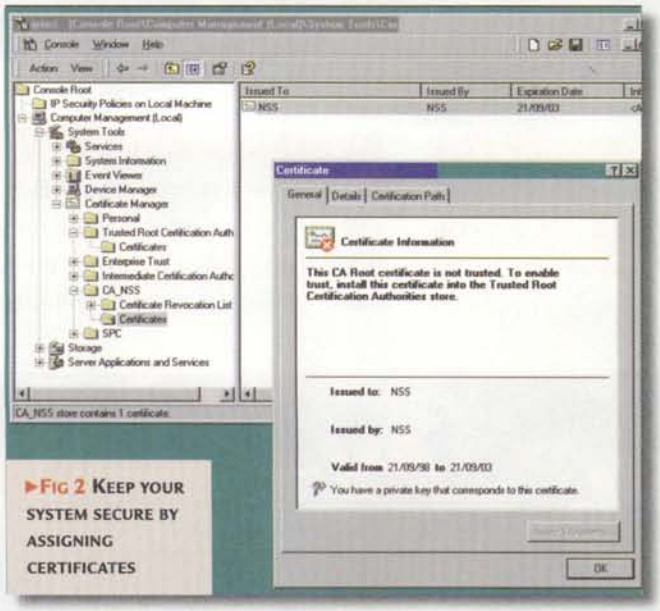
Comms and goes

Per-connection settings remove much of the frustration with today's systems where we use communications devices to connect to different networks. At present, each device can carry only one set of communications parameters, meaning constant reconfiguration when moving from network to network. Under NT 5.0, multiple settings can be stored against each device, allowing the user to choose their connection type and have the computer apply appropriate settings. Help for the mobile user is a persistent theme throughout NT 5.0 and nowhere is that more evident than in support for data synchronisation. User data can be mirrored via "offline folders", ensuring that data is always available, whether or not the PC is connected to the network, and whether or not the host server is available. Changes to data, wherever they are made, are automatically synchronised the next time a network connection is established.

At the application level, NT 5.0 plays a more active part in managing the installation process, with a new installer service built in to the OS. This manages all aspects of install and uninstall, as well as catering for shared components (you only ever install one version of the spell-checker, which is then shared between multiple apps). Using Intellimirror technology, user applications and personal settings will follow them automatically from desktop to desktop.

BOB's your uncle

Finding and storing files has been improved no end, with enhanced file open and save dialogs and the inclusion of the Distributed File System. Also available for NT 4.0, this is a means for uniting files on different physical servers into a single logical name space. Users continue to browse a share known as BOB, oblivious to the fact that the files contained within that share are actually



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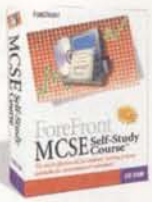

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UPCW 01

spread across numerous servers. Unattended installations have been streamlined and there will be the ability to slipstream Service Packs into the installation, removing a tedious additional step.

The whole issue of Service Pack handling has been addressed and it is no longer necessary to reapply a Service Pack after changing the system state. Automatic migration is provided from both Windows 95 and 98, and machine cloning using third-party utilities such as Ghost is now supported officially. It is even aided by a Microsoft utility called SYSPREP. Once the system is installed and running, you want it to stay that way, and it's nice to see a huge reduction in the number of required reboots and reinstallations. Reboots are no longer required following operations such as changing settings on PCI and other PnP hardware, volume management, or configuring network protocols, for instance. Nor is it necessary to reinstall the OS after upgrading the server to be a Domain Controller.

At the time of writing, performance of the system still has a long way to go, so we have to take Microsoft's word for it when it tells us that performance has been enhanced through improved memory allocation, reduced resource contention, increased file system cache, and the use of "Fibers" (mini-threads). Scalability has been improved by clustering, although this still has a long way to go before it passes most people's definition of clustering, and a larger physical memory space (up to 32Gb on Alpha, or 64Gb on Intel Xeon).

One of the biggest new features within NT 5.0 is the one that could well make or break NT in large corporate environments. Active Directory (AD) is a big step forward, replacing the trusted domain naming system which was a legacy of the old LAN Manager days. It provides a logical central repository in which can be stored details of all network resources such as users, groups and printers, as well as the security permissions for those objects. The schema is also extensible, allowing ISVs to populate it with their own custom objects (fax servers or network scanners, for instance).

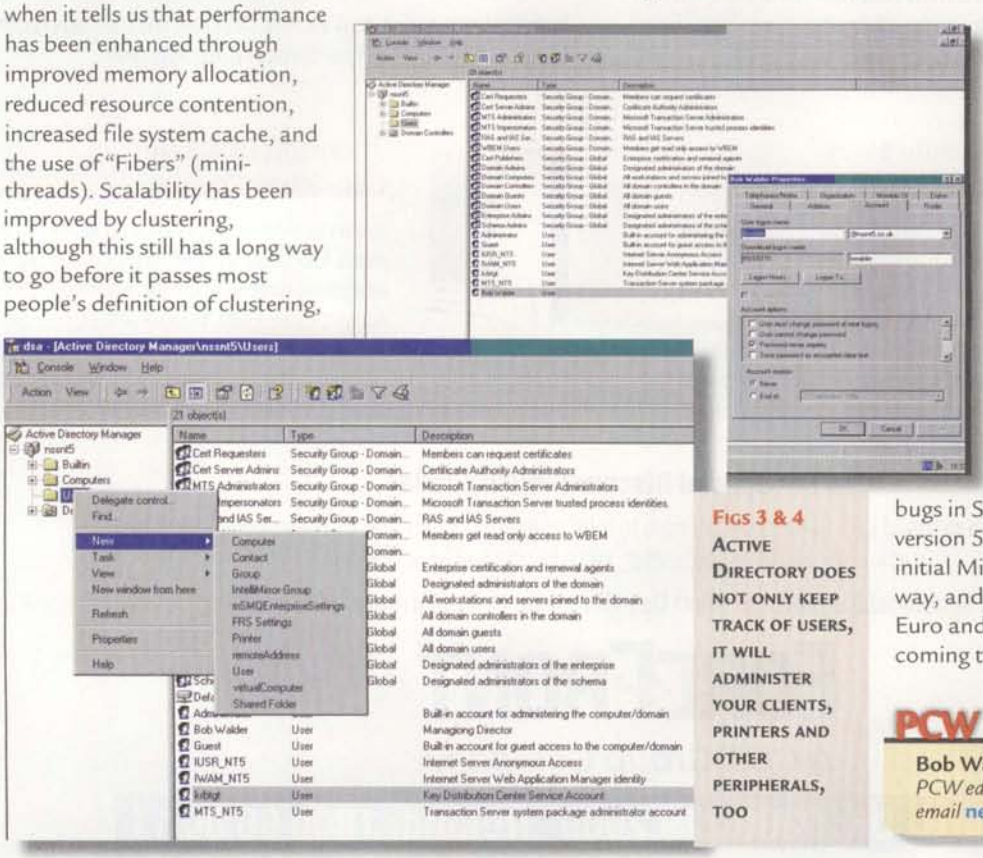
I say "logical" central repository, because it can actually be partitioned and replicated across multiple servers throughout an enterprise to improve both performance and fault tolerance. Active Directory is based around internet standard DNS domain names and has a fully-integrated DNS server and native LDAP support.

Help for the mobile user is a persistent theme throughout NT

The waiting game

What about those new shipping dates? With Beta 2 having only recently shipped at the time of writing, we are now hearing rumours that we will see Beta 3 by mid-November (you will be able to confirm its accuracy by the time you read this) and a manufacturing date of the end of March 1999. This is a good six to nine months before we were expecting it. Apparently, all serious developers of NT 5.0 software have received a letter stating that it should be ready by 1st March, which would imply that Microsoft means business. Just to add more fuel to the fire, we also hear of an NT 5.1 Beta 1 for July 1999, with a release date of version 5.1 in early 2000.

Given all the wonderful features in 5.0, how come the shipping dates, having slipped time and again, are suddenly being brought forward? I don't believe that Microsoft has had such wonderful feedback from Beta 2 that it thinks it has got it about right. My guess is that we won't see anything like a full-featured release with v5.0. Microsoft has stated repeatedly that it is "betting the farm" on NT 5.0. It seems that the initial commitment to ship "only when the customer tells us it is ready" has been replaced by the "get a roughly working version out the door as soon as possible and fix it later" attitude. Microsoft could well take the view that it wouldn't matter how good NT 5.0 was, it would be heavily criticised anyway. By stripping out non-essential features Microsoft can release the product, take the inevitable flak, fix a few bugs in Service Pack 1 and release version 5.1 after everyone had got the initial Microsoft-bashing out of the way, and also about the time when the Euro and Year 2000 projects are coming to a close, too. Smart move.



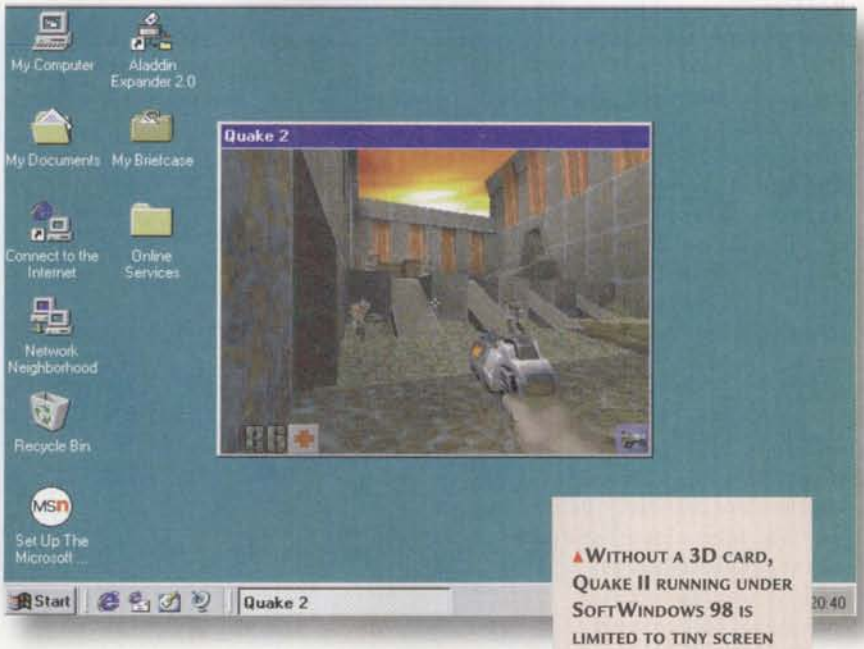
FIGS 3 & 4 ACTIVE DIRECTORY DOES NOT ONLY KEEP TRACK OF USERS, IT WILL ADMINISTER YOUR CLIENTS, PRINTERS AND OTHER PERIPHERALS, TOO

PCW CONTACTS

Bob Walder *can be contacted via the usual PCW editorial office (address, p10) or email* **networks@pcw.vnu.co.uk.**

Across the great divide

The Mac and the PC — two completely different worlds? Not so, says Cliff Joseph, who has tried out some PC emulation software, with rather surprising results.



▲Without a 3D card, Quake II running under SoftWindows 98 is limited to tiny screen sizes

Regular readers will have noticed that the *Hands On Mac* column is an oasis of sanity, resting serenely in the midst of a lot of, frankly, unpalatable Windows PC stuff. The trouble is, of course, that Windows is pretty hard to ignore: there are times when even the most die-hard Mac user needs to be compatible with the PC world. Macs can read PC disks, and most major Mac and PC applications share a number of cross-platform file formats that allow you to easily exchange files with PC users. However, there are times when you may need to run software that simply isn't available on a Mac.

Mind the gap

The Mac has always been short of certain types of software. Games software is probably the most obvious example, but there are many business applications that have never been available on the Mac. FileMaker is one of the few cross-platform databases available for both Mac and PC, and there's not much in the way of accounting software either. And, if your organisation has some sort of legacy DOS software that is still being used, you can bet that nobody is going to volunteer to rewrite it just for the Mac. But at long last, PC emulation on the Mac is becoming a truly practical proposition. And, just as we were preparing to go to press, SoftWindows 98 landed on my desk, so a quick review of the Mac/Windows compatibility story seemed like a good idea for this issue.

The first PC emulator for the Mac was Insignia's SoftWindows. That was joined a couple of years ago by VirtualPC from Connectix. There are minor differences, but these two programs work in essentially the same way, using software to emulate the workings of specific PC hardware components. VirtualPC 2.0 emulates almost an entire PC system. It provides (in software) a Pentium processor with the complete MMX instruction set. It also emulates a complete motherboard, including an Intel Triton logic chip, an S3 Trio graphics processor and a Creative Labs SoundBlaster Pro sound card. These are all standard PC components, ensuring maximum compatibility with games and other types of software. SoftWindows provides the same basic features, with one or two differences such as better networking options. On top of all this virtual hardware you can then load DOS and/or Windows, depending on your requirements.

There are times when even the most die-hard Mac user needs to be compatible with the PC world

VirtualPC will even allow you to install OS/2. Once installed, both programs allow you to use your Mac peripherals within the PC environment. And because the virtual PC inside your Mac is treated as just another software application, you can have Mac and PC programs running alongside each other and copy and paste information between them.

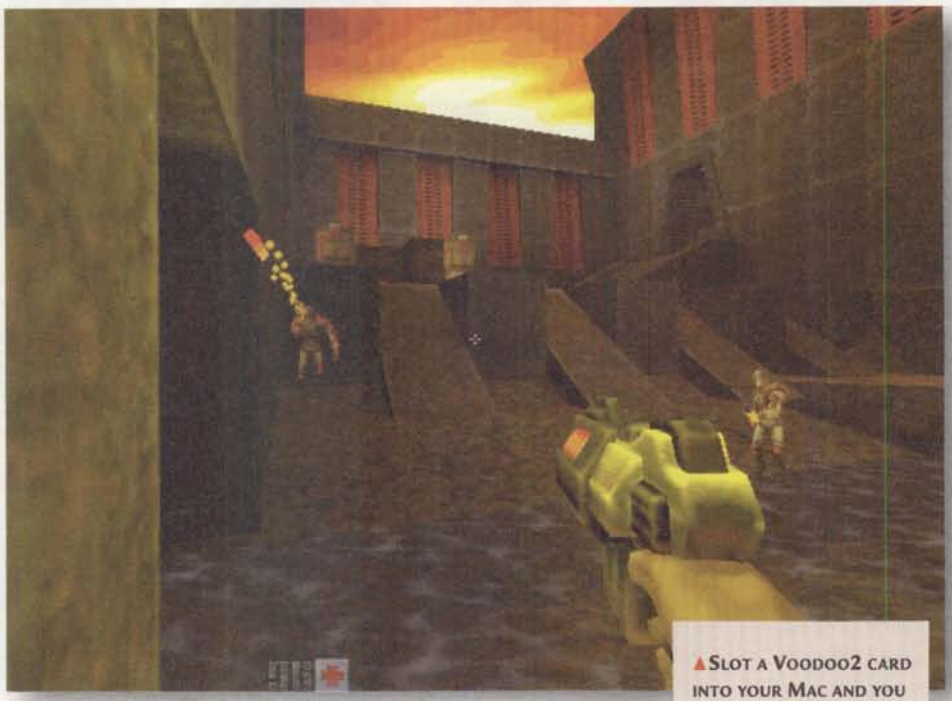
The biggest issue with software emulators has always been speed. In the past, these programs simply ran too slow to be of practical use. However, things have changed greatly since Apple adopted Motorola's G3 processor across its entire product range. The performance of the G3 allows you to run these PC emulators at pretty impressive speeds. Connectix and Insignia will quote all sorts of benchmark figures to prove that their product is faster than its rival, but there's no doubt that both of these emulators are really quite amazing pieces of software. It's hard to directly compare the performance of an emulated PC with that of a real system, but I'd say that a G3 Mac can provide emulated performance on a par with a Pentium running at 100 to 150MHz. That's not going to break records, but it's enough to handle a wide range of PC business applications at acceptable speeds.

In addition to having a fast processor, the emulation performance will also benefit from having plenty of RAM. You'll need around 16Mb for the MacOS, plus about 8Mb for the emulation software itself. Then add

however much RAM you want your virtual PC to have. So, if you want to emulate a PC with 32Mb RAM, you'll need at least 56Mb RAM on your Mac. Your virtual PC will also need some hard-disk space so be prepared to free up at least 300Mb of that, too.

The crunch, though, comes when you try to run PC games under emulation. One interesting feature of SoftWindows and Virtual PC is that they allow you to use 3D accelerators based on the 3Dfx Voodoo chips. SoftWindows 98 supports both Voodoo and Voodoo2 cards, while Virtual PC currently only supports the original Voodoo. Installing one of these cards into your Mac takes a lot of the strain off the emulated Pentium processor and provides big increases in performance.

To test this feature I installed a Creative Labs 3D Blaster Voodoo2 card into a 300MHz G3 Mac, with 64Mb RAM allocated to SoftWindows 98. The Voodoo2 card is designed specifically for PCs but Macs use the same PCI slots as PCs, so there's no physical reason why you can't install it into a Mac. There's no Mac driver currently available for this particular card so it won't work with Mac games. But when you launch the emulator, Windows will automatically detect the card and prompt you to install the supplied Windows drivers. The results vary a lot from game to game. I couldn't get Tomb Raider installed properly, although that seemed to be the result of a problem with the game's DOS setup utility rather than SoftWindows itself. The air-strike game, Incoming, ran rather poorly, but remarkably, Quake II ran at very acceptable speeds — something I really wasn't expecting. The unpredictable performance of these games means that SoftWindows and Virtual PC cannot be recommended to serious gamers just yet, although their performance is still pretty impressive. But let's face it, dedicated games fans are going to buy PCs anyway. For business or home users who occasionally need to run PC business software, emulation really is a worthwhile option.



▲ SLOT A VOODOO2 CARD INTO YOUR MAC AND YOU GET QUAKE II IN ALL ITS FULL-SCREEN, HIGH-RES GLORY

For business or home users, emulation is a worthwhile option

An alternative to emulation

There is another alternative if PC emulation software is too slow for you. OrangeMicro makes a range of add-on cards which manage to cram most of an entire PC system on to a single PCI card. The latest, the OrangePC 620, is equipped with a 200MHz Pentium processor that can be further upgraded to 300MHz with an AMD K6. It has 16Mb of onboard RAM and 4Mb VRAM.

The OrangePC card provides better performance than software emulators can currently offer, and it cleverly allows you to switch between Mac and PC modes using a simple keyboard shortcut. The only problem with the OrangePC is that it doesn't work with 3D accelerators.

OrangeMicro is about to release a new card that has a 3D accelerator built in to it and which is aimed specifically at the games market. However, it would still be better if you could use third-party cards in conjunction with those from OrangePC as this would provide additional upgrade options in the future.

PCW CONTACTS

Cliff Joseph *can be contacted via the PCW editorial office (address, page 10) or email* mac@pcw.co.uk

SoftWindows 98 *£110 (ex VAT) from Insignia Solutions 0800 667706* www.insignia.com

Virtual PC 2.0 *£99(ex VAT) Win 95, £119.99 (ex VAT) Win 98 from Connectix 0181 200 8282* www.connectix.com

OrangePC 620 *Around £600 from Vernon Computer Rentals 0171 720 7000*

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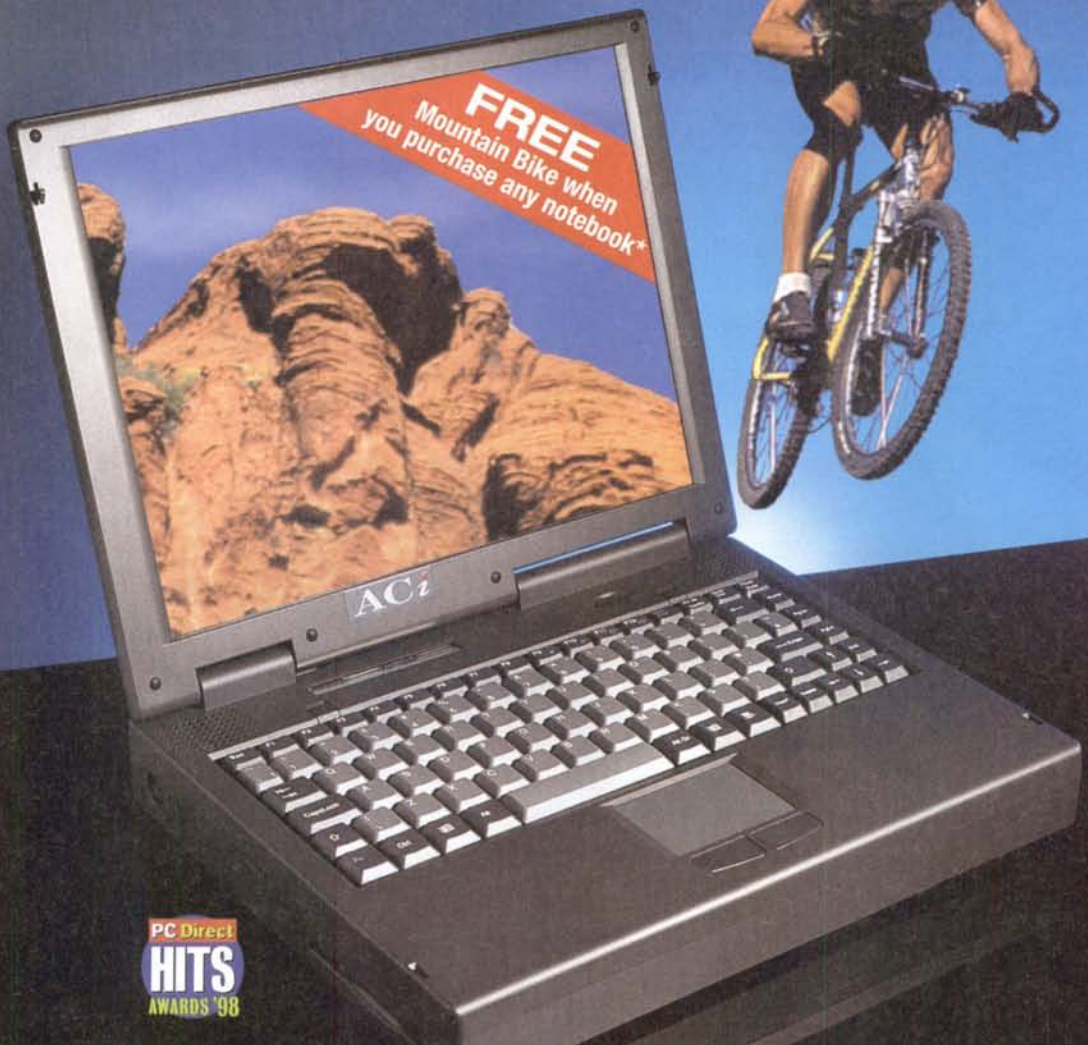

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(reviewed in PCW November 97, p329)

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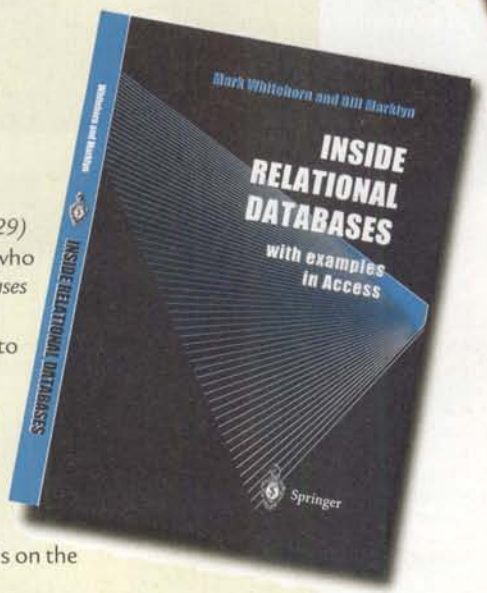

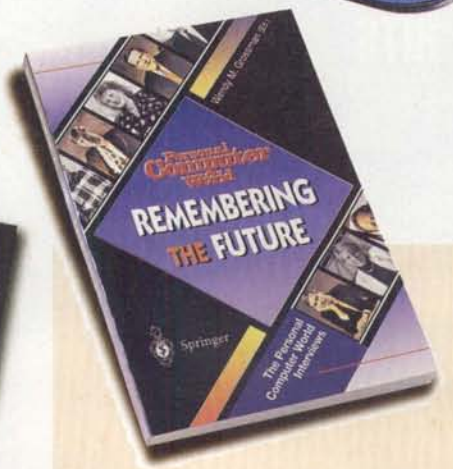

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leisure lines

Christmas draws close and in *Leisure Lines* this month we have a superb selection of software, any of which would make a great Christmas gift. In *Screenplay* we review a selection of games which were launched at the recent ECTS show in London. There are two expansion packs, Age of Empires – The Rise of Rome, and **QUAKE II — GROUND ZERO**. We fly Microsoft's new Combat Flight Simulator, and puzzle over a strange game called Reah. We try to beat the Lie Detector and fight *ennui* with the perfect boredom reliever, Lose Your Marbles. Study the stars with the Starry Nights Deluxe astronomy package featured in our *CD-ROM* section, and there's a world of information at your fingertips in Microsoft's **ENCARTA DELUXE 1999 EDITION**. If those fingertips happen to be green, then take a look at Gardener's World, and Music Maker V2000 really does sound good. In *Kids* we have the fabulous **TELETUBBIES** CD, a big Christmas hit with kids of all ages, and we get back on the educational track with Adi English and Maths. Bill Gates dominates our *Books* section. There's a profile of him in *Bill Gates Speaks* and an insight into the way he works in **THE MICROSOFT FILE: THE SECRET CASE AGAINST BILL GATES**. We also feature a hefty in-depth guide to upgrading and repairing PCs. In our *Competition*, **FILEMAKER** is giving away £3,000-worth of software. You also have a chance to win the new Chambers dictionary if you complete our *Prize Crossword*, and *Brainteasers* will give you something to think about. And last but never least, *Retro* recalls the taste of the Apricot F1.

▲ ADI ENGLISH AND MATHS

▲ [ABOVE, TOP] GARDENER'S WORLD; [ABOVE] MAGIX MUSIC MAKER V2000

ETELKA CLARK, LEISURE LINES EDITOR
ETELKAC@VNU.CO.UK

Age of Empires: The Rise of Rome

Start a civilisation and build an empire. This popular game of social engineering gets even better.

Age of Empires came out towards the end of 1997 and impressed strategy fans with its neat blend of civilised social engineering and bloodthirsty battle planning. It has quickly become one of Microsoft's notable successes.

For those new to the game, Age of Empires is a beautifully detailed and animated chance to start a civilisation from the ground up, beginning in some cases with a single primitive male and ending, several days of conquest and pillage later, in your total domination of the known world. The price tag is rather misleading: Microsoft will actually reimburse you to the tune of £10 when you buy the expansion pack, making the net cost a mere £15. For your money you get another four civilisations to add to the existing list of 12, and a range of new units to research and create, including my personal favourite, the armoured elephant.

FIGHT A CAMPAIGN TO FURTHER YOUR CHANCES OF WORLD DOMINATION

There are new landscapes, too, in case you were getting sick of the old ones, and the game-playing map has been made even larger. Best of all, there are 19 new scenarios which you must build, farm and fight your way through, culminating in four large-scale campaigns.

The Rise of Rome is a good way of reinvigorating this one-year-old game, ironing out problems and making sure that we stay interested while Microsoft toils away on the big one that we're all really waiting for: Age of Empires II.

PAUL TRUEMAN

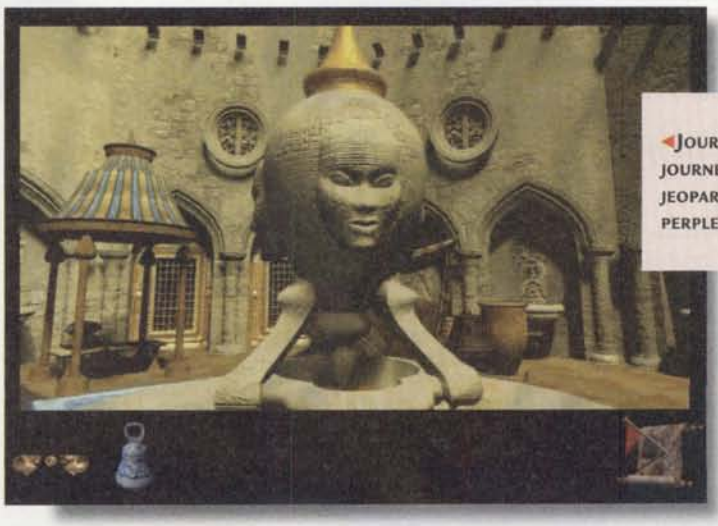
PCW DETAILS

★★★★

Price *£24.99*
Contact *Microsoft 0345 002000*
www.microsoft.com
System Requirements *Windows 95/98 or NT, P90 processor, 16Mb RAM, 24Mb for NT, double-speed CD-ROM.*

Reah

A hostile planet of puzzles awaits in a foreign dimension.



JOURNALIST JOURNEYS INTO JEOPARDY TO SOLVE PERPLEXING PUZZLES

If you thought your gran's house was the only place known to man where modern technology will not work, then you have not yet come across Reah. It is a distant, hostile planet harbouring a portal into another dimension where technical gadgets are rendered useless. As a journalist, you pass through this portal willing to risk your safety in exchange for being a pioneering explorer of this strange sister planet. You realise your mistake only when it is too late; the portal disappears and you are left stranded.

Control is wholly mouse-driven, making navigation easy and movement smooth but limited. Although you can turn through 360° it is not possible to walk to all points in a scene, only specific areas. Nevertheless, the quality of this game is stunning and features some of the most clearly-rendered scenes we have seen on the PC. Full-motion video allows you to interact with characters as you rack your brains to solve the devilish puzzles this strange world presents. These are not your run-of-the-mill "find key, open door" tasks. Just working out where or what each puzzle is in this immense world can be a mammoth task which soon gets tedious. Those with a DVD drive will be glad to hear that they can put it to good use here because a DVD release follows the six-disc CD-ROM edition.

NIK RAWLINSON

PCW DETAILS

★★

Price *£39.99*
Contact *Anglia Multimedia 0500 600191*
www.blackfriar.net
System Requirements *Pentium 90MHz processor, 16Mb RAM, quad-speed CD-ROM, 1Mb SVGA graphics card, Windows 95 DirectX driver, Windows 95-compatible sound card (32Mb recommended).*

Combat Flight Simulator

At last! Microsoft adds armoury so you can re-fight the battle for the skies in true WWII style.

Combat Flight Simulator is probably Microsoft's biggest game release of the year. After years of unofficial weapon add-ons to spice-up existing peaceful versions of Flight Simulator, fans of the aerial genre everywhere will be getting excited about the chance to let rip in combat – this time with Bill Gates' official approval.

If you are running the game on a PC with a top-notch processor and graphics card, you can afford to switch on all the graphics refinements at your disposal. If there is a criticism to be made of the "look" of this simulator, it is that, even with most of the effects switched on, when diving it is easy to lose one's sense of height *vis-à-vis* the landscape because the ground does not seem to come into focus as it would in real life. The aeroplanes respond well and it is up to you whether you fly throughout a whole campaign, spanning the war, or simply "duke it out" in quick-combat mode.

▶ OUCH! ALGY GETS BLOWN TO BITS BY THE BOSCH

Our review copy of the game was a Beta version, and although our manual had been photocopied, the 200-page tome still weighed in on the hefty side. This is a sentence never previously written (at least, not by this reviewer) but... the manual accompanying the game *is* fascinating. Packed full of every conceivable fact about the games' WWII setting, you can learn about the basic physics of flying, the major battles and the flying aces on both sides of the war.

PAUL TRUEMAN

PCW DETAILS

★★★★

Price *Price £49.99*
Contact *Microsoft 0345 002000*
www.microsoft.com
System Requirements *Pentium 133MHz processor, Windows 95/98 or NT4.0 operating system, 16Mb of RAM, 200Mb free hard-disk space, quad-speed CD-ROM drive.*

Quake II – Ground Zero

You know the mission but now you are faced with more levels, and an anti-matter bomb to use.

Milking the Quake II cash cow once *more before Christmas is* Ground Zero, yet another add-on pack to the original game. Again it's your noble duty to rescue a group of fellow marines being held captive in space. Armageddon is near and soon you will see searing lasers, severed limbs and pounding action.

The mission pack has 14 new levels but there is little variety to the gameplay and most of the weapons and enemies are the same as in the original game, except for the odd new one like the vicious spidery creature and an anti-matter bomb. However, the enemies are more intelligent. They dodge quicker, chase you around many more corners and fire while running. The graphics are also very similar to the original and require a 3D accelerator to run at their best. Unfortunately, this means they are not as stunning as those in the equally popular game, Unreal. In fact, the whole mission pack has little variety. Most of it gives the impression of being set in a huge warehouse with stacks of crates piled everywhere. The pervasive, dirty-brown textures and lack of multi-coloured lighting also make the pack look flat at times. However, as add-on packs go, Quake II's Ground Zero is a passable addition.

◀ A DEATH WORSE THAN FATE AWAITS THE UNWARY. YOUR ENEMIES ARE MORE INTELLIGENT THAN THEY WERE IN THE ORIGINAL GAME

AJITH RAM

PCW DETAILS

★★

Price *Price £24.99*
Contact Activision 01895 456748
www.activision.com
System Requirements *Windows 95/98, Pentium 166MHz processor (200MHz or above recommended), 32Mb RAM, quad-speed CD-ROM, SVGA video card (3D accelerator recommended), mouse, Windows-compatible sound card.*

Lie Detector

I don't believe it! Just let sleeping dogs and this CD lie.

I would be lying if I said this game was worth buying. But how will you know whether or not I'm telling the truth? Well, you won't, especially if you test me using the Lie Detector.

This CD is not meant to be taken seriously, but it could be quite a laugh if you're testing your friends or work colleagues on embarrassing topics. The choices include Job and Career, Sex for men or women, and Life and Conscience. Alternatively, you can compose your own questions. But it would help if the program actually worked. Generally, when I told it the truth, it would "detect" that I was *lying*; yet when I told it an outright lie, it would "detect" that I was telling the *truth*. Occasionally it got it right, but mostly I beat it. The sensor pad, which is worn on the finger, can be set to register different levels of sensitivity. I tried re-programming it — not that I'm thick-skinned — but still it didn't understand me. It just made the graph look prettier.

▶ IS SHE A BARE-FACED LIAR? AN 'UNTRUTH' IS SHOWN ABOVE THE YELLOW LINE WHILE A 'TRUTH' IS SHOWN BELOW. OH, HELEN, WHAT A WHOPPER!

The novelty value of this production wore off after the first question. It's just hugely boring, waiting for your response to be registered. And, if you laugh or someone gives you a pat on the back, the sensor picks it up and you'll be likely to get a false reading. Still, at least you'll be safe knowing that the truth won't hurt — trust me!

HELEN FORTGANG

PCW DETAILS

★

Price *£19.99*
Contact *Black Friar 0500 600191*
www.blackfriar.net
System Requirements
486 PC or above, 4Mb RAM, 256-colour display, Windows 3.1 or Windows 95/98, double-speed CD-ROM, 40Mb free hard-disk space, sound card (optional), 9-pin serial port, mouse.

Lose Your Marbles

It's marbellous how easy it is to get hooked on this. Let 'em roll!

This game first made an appearance in the Plus! 98 pack for Windows 98 and I quickly became a fan. Hours flew by and bedtime passed unnoticed as I stared transfixed at marbles clicking and popping on the screen. I knew it was only a transference of my age-old Tetris obsession, but I didn't care. I was hooked. Rocket science it's not — you simply line up three, four, or five marbles of the same colour on the pitch line and they disappear. Marbles can be moved up and down or along the pitch to help you get them into line. All the while, however, marbles continue to fall onto the ends of the stacks, filling them up. If an entire stack becomes paralysed, the game finishes.

◀ DON'T LET THE STACK FILL UP OR YOU'LL LOSE YOUR MARBLES

And that's it. Apart from a few special marbles, the game stays much the same no matter what level you reach. Sure, you get some different backgrounds and bonus rounds, but it's not quite difficult enough to want to stick with it forever — unlike its forefather, Tetris. Also, there is no high-score facility and each time you quit, you have to start all over again at the beginning, which is extremely tedious.

A further caveat is that the system requirements state that Marbles will run on a P60. And so it might. But trust me, don't do it. I found it infuriatingly sluggish on anything lower than a 133MHz.

SUSAN PEDERSON

PCW DETAILS

★★★

Price *£19.99*
Contact *Roderick Manhattan Group 0181 875 4441*
www.segasoft.com
System Requirements *P60 or better, Windows 95, 1Mb SVGA, 8Mb RAM.*

Starry Night Deluxe

View the night sky, in all its celestial glory.

A program for those with stars in their eyes, Starry Night Deluxe threatens to consign Patrick Moore to the dole queue. This software makes it easy for a beginner to explore the night sky, while providing enough depth for the more serious gazer.

With a view of the sky from anywhere in the solar system, be it your house or Oberon, you can observe the classic illustrations that mark constellations, follow the paths and orbits of planets and comets, and even map out your own star charts. You can time travel from 4713 BC through to 9999 AD, and although the sky doesn't look dramatically different, it's interesting to imagine that this is what you would have seen, or will see, at a particular moment in time. You can open multiple windows to view one event from different places simultaneously, or set the stars so that you can see what is visible out of your window, be it in the city or the country. You can make videos of galactic events and edit your own sequences. The tools perform in the same way as your word processor or graphics package, making it nice and easy to work with, and there is a direct link to the LiveSky internet site which provides up-to-the-minute information.

◄THERE'S MORE TO THE SKY THAN MEETS THE EYE, AS STARRY NIGHT DELUXE SHOWS YOU

Starry Night Deluxe is a realistic desktop planetarium that will provide the best star-gazing ambience there is, through a monitor screen.

HELEN FORTGANG

PCW DETAILS

★★★

Price *$89.95*
Contact *001 41 6 410 0259*
www.sienasoft.com
System Requirements *PC: Pentium processor or higher, 256-colour capable, CD-ROM drive, Windows 95/98, NT 4.0 or later, 8Mb RAM, 15-60Mb free hard-disk space. Mac: 68040, PowerPC or better, 256-colour capable, CD-ROM drive, System 7.0 or later, 8Mb of RAM, 10-40Mb free hard-disk space.*

Gardener's World

A handy companion for the green-fingered.

Gardener's World, hosted, as you might expect, by jovial Alan Titchmarsh, provides a plant encyclopaedia and advice on dealing with pests and problems. It also lets you create a garden diary.

When you first use the CD, you will be asked for your name. Up to ten users can use the program and each user has their own password — overkill perhaps on a gardening CD. Each time you log on, the disk will open at the diary section and give you a tip of the day or a plant of the day. There is also the chance to add your own notes on what you have been doing in the garden, creating a year-by-year diary. You can also compile an inventory of the plants and shrubs in your garden.

There are sections giving advice on what you should be doing in the garden at certain times of the year, and suggestions for special projects such as pruning roses or building a pond, as well as general problem-solving. Most of the advice is fairly standard stuff — nothing most gardeners won't already know. Probably the most useful section is the Plant Finder which lets you search the huge plant database, selecting plants according to when they look their best, the kind of soil they thrive in and how much sun they need. Navigating around Gardener's World is much quicker than using a gardening encyclopaedia, but otherwise this CD provides little you couldn't get from the Royal Horticultural Society encyclopaedias.

▲AVOID THOSE HORTICULTURAL HORRORS WITH ALAN TITCHMARSH AND HIS TEAM

ADELE DYER

PCW DETAILS

★★★★

Price *£29.99*
Contact *BBC Multimedia 0181 576 2945*
System Requirements *Pentium, 16Mb RAM, Windows 95.*

Encarta 99

A well produced and beautifully presented reference and learning package.

Encarta's elegant interface makes it one of the most inviting CD-ROM reference works, and the incorporation of Shockwave compact animation makes it feel more like you are directing a small television documentary. The information in the 11 million words that go to make up the package's 32,000 articles is comprehensive and well written, and searching on various keywords turned up very few occasions when a match was not available.

The only slight inaccuracy I could find after several hours of use was an aerial photo of London's Docklands incorrectly captioned as the city's financial district. We were surprised, as this is not an American production adapted for a UK audience – it is commissioned and edited in London. Over 13,000 illustrations, 140 videos and 2,300 audio clips provide the user with added value and make this much more than merely a book in binary format. Subtitles allow the aurally impaired to enjoy the media clips and the suite incorporates the Concise Oxford Dictionary. An extensive index will aid searching, getting you where you want to be fast, while the bundled research organiser is a good learning aid for students. Fascinating 360° panoramas allow you to stand in locations as diverse as the Space Shuttle and Piccadilly Circus and perform a Wonder-Woman-esque spin to view your surroundings. In short, a highly recommended package.

NIK RAWLINSON

▶ A WORLD OF INFORMATION AT YOUR FINGERTIPS INCLUDES LOCATIONS CLOSER TO HOME

PCW DETAILS

RECOMMENDED PERSONAL COMPUTER WORLD

★★★★★

Price *Encarta Standard £49.99, Deluxe £79.99, Reference Suite £99.99, World Atlas £49.99*

Contact *Microsoft 0345 002000* www.encarta.com

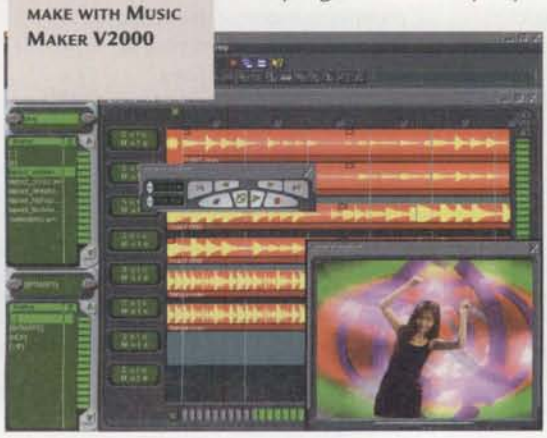
System Requirements *486DX/50 or higher, Windows 95/98, NT4 or later, 8Mb RAM for Win95 (16Mb for Win98 and NT4), 30Mb free hard-disk space. Double-speed CD-ROM or faster, SuperVGA 256-colour display at 640 x 480 or higher, 5Mb additional hard-disk space to use Encarta Research Organiser.*

Magix Music Maker V2000

It's only rock 'n' roll – and a lot more besides – and we like it.

Lately, there seems to have been a huge boom in music-making software – to the extent that it's no longer new or groundbreaking. That is, until you try Music Maker V2000 from Magix, which seems to be the only production that has truly got to grips with the concept of desktop sampling.

▼ BOOGIE ON DOWN TO THE SOUNDS YOU MAKE WITH MUSIC MAKER V2000



Rather than relying on gimmicks to boost sales, this program takes things a little more seriously. It manages to support up to 16 tracks (32 in the Deluxe version) and offers high performance, all without you needing a degree in sound engineering.

Because the tools perform in the same way as your word processor, it's very easy to manipulate and edit your sounds and sequences. Everything you do is clear on-screen, whether you're using the mixer, viewing video sequences or simply dragging your samples to each track.

The real beauty of this CD is the sounds that it produces. There are no tailored and stereotypical samples that so many programs of this type tend to employ. This production uses "real" sounds that are flexible: you can manipulate them to sound just the way you want them to.

For a little extra money you can obtain Magix Soundpool, which allows you to access quality sounds in the style of music that you wish to sample. It's all royalty-free and covers a wide range of musical styles, from R'n'B and HipHop to Techno and Industrial Rock.

HELEN FORTGANG

PCW DETAILS

RECOMMENDED PERSONAL COMPUTER WORLD

★★★★★

Price *£39.99 (Standard), £79.99 (Deluxe)*

Contact *Magix Entertainment 0171 917 2897* www.magix.net

System Requirements *Windows NT/95/98, Pentium PC or higher, 30Mb free hard-disk space, 16 Mb RAM, VGA card, 16-bit sound card, CD-ROM drive, mouse or compatible keyboard.*

Play with the Teletubbies

Fun with Tinky Winky, Dipsy, Laa-Laa and Po. What child — or grown-up — could resist?

We have all, at some point, encountered the Teletubbies. They are on the TV in the early mornings, they were in the music charts, and now they are on this delightful CD-ROM. There is no getting away from it — kids love these strange, colourful creatures, and they will certainly like this new CD. The interface is very similar to that of the television programme, with brightly coloured scenes including the Tubbytronic Superdome and those lush green hills that the Teletubbies are so famous for playing on.

The CD-ROM contains seven activities in which the child can either watch or take part in. You can chase Noo-noo around the Tubbytronic Superdome, help the Teletubbies make a mess with tubby custard, play hide-and-seek or make tubby toast. Each one repeats itself again and again until the child wants to move on. As this program is aimed at children between the age of two and four years, a special cursor in the form of a pink sparkle helps to control the mouse. Instead of having to point and click, the child can simply wave the cursor over the animation. This CD is the result of extensive testing with children. Varying levels of interaction cater to the range of abilities amongs young children, allowing them to progress at their own pace. With plenty of giggling and rhymes to repeat, this enchanting CD will delight children of all ages and is guaranteed to be a big hit.

ETELKA CLARK

►LIFE IN LAA-LAA LAND: HAVE FUN WITH THE TELETUBBIES AND THEIR FRIEND, NOO-NOO

PCW DETAILS

★★★★

Price *£24.99*
Contact *BBC Multimedia Section 0181 576 3592* www.bbc.co.uk/education/teletubbies/
System Requirements *Windows 95 or later, Pentium P100 processor with 16Mb RAM, quad-speed CD-ROM drive.*

Adi – English & Maths

Learning that's out of this world — and that's just the teacher!

Many children may think their teacher is an alien. Now they can be sure. Adi beams down as an intelligent alien friend, here to guide the pupil through this educational program, teaching, correcting, rewarding and advising. After choosing a face to represent themselves and giving a few personal details, the child enters Adi's attic. The pupil explores the room, clicking on particular objects to reveal different topics. Click on the rocket ship to bring up information about space exploration. Click on the jukebox to listen to clips of different music from around the world. The Adi series displays a high standard of 3D graphics and smooth animation, which really brings the CD to life. The lessons are clearly introduced and the instructions can be listened to repeatedly if necessary. The program encompasses core school curriculum requirements and comprises eight titles in total (years three to ten). The series makes maximum use of today's technology by including optional internet access. It provides real-time "virtual classes" through a web site, where the pupil can attend and make friends with other children. As well as classes in the internet section, there are opportunities to make cartoons, send messages to friends and, crucially, allow parents to monitor their children's progress. It makes learning an enjoyable and rewarding experience.

HELEN FORTGANG

◄WHAT A COOL-LOOKING ATTIC! THERE'S PLENTY TO SEE AND DO UP HERE WITH ADI

PCW DETAILS

★★★★★

Price *£29.99*
Contact *Knowledge Adventure 01189 209100*
System Requirements *Pentium 75 or higher, Windows 95, 16Mb RAM, quad-peed CD-ROM drive, Windows-compatible sound card, 16-bit colour.*

PC Price Crash

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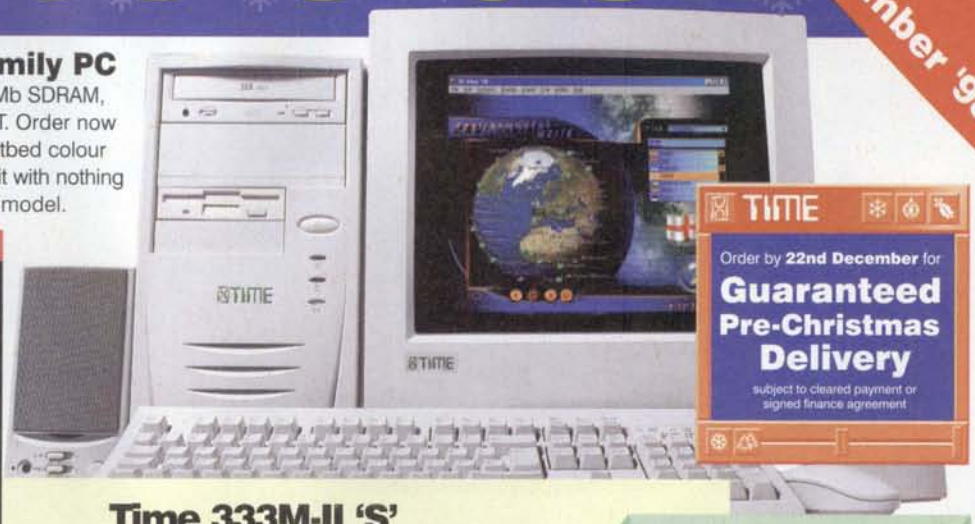

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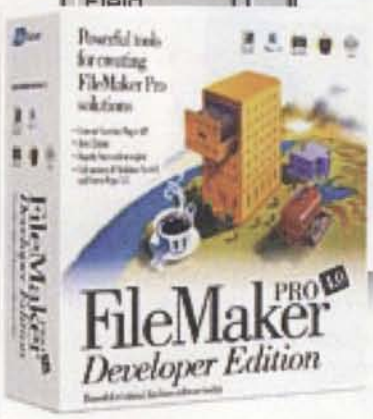

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1. Via our web site at www.pcw.co.uk, or
2. Write your name, address and daytime telephone number on a postcard, or on the back of a sealed envelope. Mark your card "PCW/Jan FileMaker Competition" and send it to: P.O. Box 191, Woking, Surrey GU21 1FT, by 4th January 1999.

Please state clearly on your competition entry if you do not wish to receive promotional material from other companies.

RULES OF ENTRY

This competition is open to readers of *Personal Computer World*, except for employees (and their families) of VNU Business Publications and FileMaker.

The Editor of *Personal Computer World* is the sole judge of the competition and his decision is final. No cash alternative is available in lieu of competition prizes.

Apricot crumble

Simon Collin on why the rather eccentric Apricot F1 was crushed by the opposition.

In the dark and distant days when manufacturers jostled for supremacy and standards in the PC market, one of the odder range of computers was the Apricot series from ACT. The first in the line was the stately Sirius (like the DEC Rainbow, covered a few issues ago, non-IBM PC compatible); this was followed by perhaps the most stylish of all PCs, the Apricot PC. Unimaginative name, great design.

The Apricot PC was sleek, slim and had a fold-down lid in case the ugliness of the disk drives offended you too much. However, enthusiasts got most excited about the keyboard: this had a little set of six membrane function keys with a programmable LCD text panel above each one, so that software applications could create their own key labels on the LCD display. It was great, until the fragile ribbon cable inside the unit cracked – and they all did.

◄ THE APRICOT F1: A PRIME EXAMPLE OF INNOVATION OVER FUNCTIONALITY

Moving swiftly on, we arrive at the Apricot F1, my favourite oddity. Compared to the elegant streamlined case design of the PC, someone at Apricot towers took the exact opposite approach for the F1. The idea was that the case was the same width as the monitor. Why? It stuck out twice as deep and looked like a great plastic brick.

The questionable styling aside, Apricot managed to sneak in another cute keyboard feature. Rather like Maserati's sports car's oval clock of the time (it appeared in every model) the Apricot crowd-pleaser was the latest gizmo built in to its keyboard. With the new F1, Apricot decided that cables were out and ensured that the keyboard was linked to the base brick via an infra-red lightbeam. Nowadays, every PDA and printer has an IrDA link, but at the time it was still quite something. The problem was, you had to be in direct line of sight or it didn't work. If you wanted to move the keyboard, Apricot supplied a string of fibre-optic cable. This was fragile, not very bendy and took up more space than a simple cable. Quoting from the user manual wraps up the subject of keyboards with a rather silly warning, and firmly positions the F1 as a SoHo fun tool: "You can even work at home with the F1 on the coffee table and the keyboard on your lap...the link will usually work quite happily at distances of up to two meters from the computer, although of course you might find it difficult to see the information on the screen at that distance."

The idea was that the case was the same width as the monitor. Why?

Your shiny new F1 was fitted as standard with 256Kb of RAM, but this could be easily expanded to 786Kb with just a few extra memory cards. A strange device called an MSD (mass storage device) was optional. Apricot was careful never to write "hard disk" in its manuals, preferring this wonderfully old-fashioned acronym instead. The F1 with a hard disk was actually badged the F10, but this was otherwise the same machine.

A disappointment was the visual display on the F1 – a real let-down after the fantastic high-resolution PC monitor. F1 users had a choice of mono or colour CGA display, and my display always wiggled and hissed to itself in a distracting manner.

Lastly, a modem card could be fitted to access all the latest news from the Prestel online service. The F1 ran a custom version of DOS that was IBM PC compatible up to a point. Some standard software would run, much would not; this was mostly due to the non-standard screen display. Diskettes from an IBM machine could normally be read on an Apricot, although the same was not generally true in reverse. I remember spending hours rigging up a serial link between an F1 and an IBM PC to send files one way, and using the disk to send them back the other.

Finally, Apricot dropped the range, continued on as an independent UK manufacturer and then was bought by Mitsubishi. It has since developed normally sleek and stylish power servers and PCs. Look carefully, and you might still see either a flap to hide the disk drives or a gizmo on the keyboard – a reminder of past glories.

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	333-2 GT	15"	805
	333-2 GT	17"	806
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	333-2	17"	808
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TSHOM

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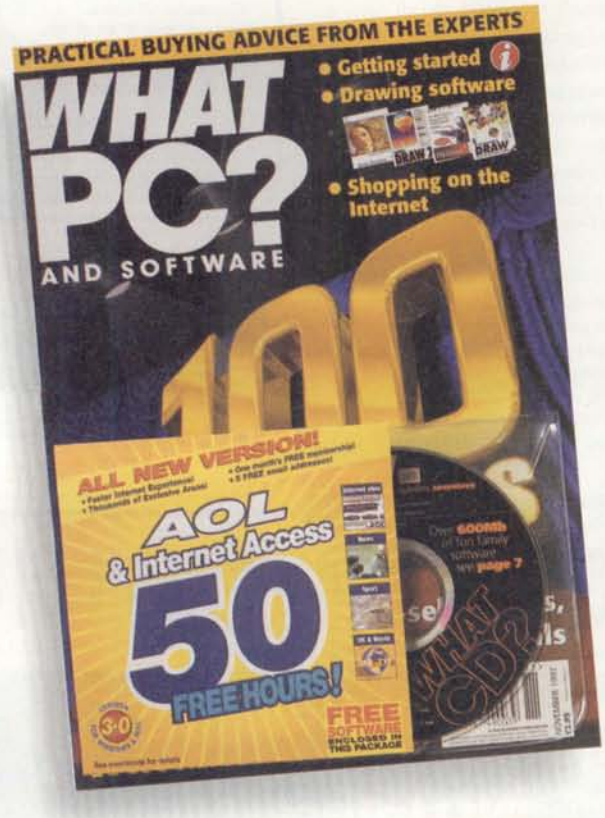

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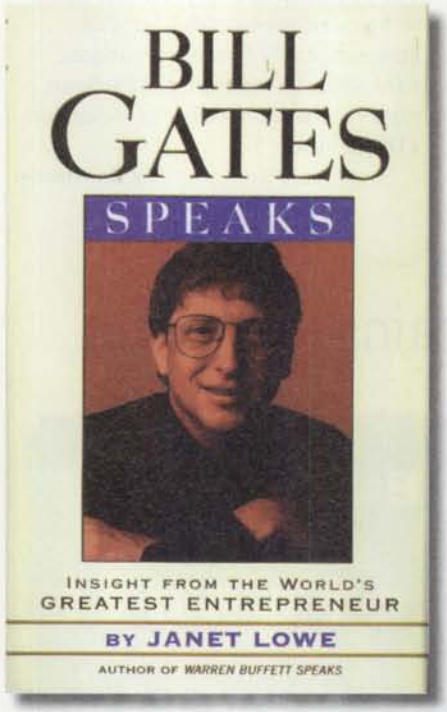
PRACTICAL BUYING ADVICE FROM THE EXPERTS

Bill Gates Speaks

Whatever you might think about Bill Gates, he's an interesting character. Hidden behind that geeky exterior is a sharp business mind which is now pitting its wits against none other than the US government. Why, then, does Janet Lowe's quasi-profile of the great man leave me stone cold?

Perhaps part of the reason is the format of the book. Lowe's internet research skills are undeniably superb. She has obviously culled information from umpteen web pages and printed material, for quotes both by and about Gates and his achievements. Nevertheless, she doesn't so much fuse them together as merely juxtapose them like so much junk at a car boot sale. Lowe is more collator than author and makes little attempt to add her own comments to the soundbites that she so proudly displays. One example is her collation of "God versus Gates" jokes; a tired collection of web witticisms about encounters between the Almighty and the geek that inherited the earth. But some of the most frightening commentary in the book comes from Gates himself – didn't this guy ever hire a PR representative? When once faced with a baby, he reportedly pointed at it and stated, "That scares me". And, when asked what were his personal goals for the next ten years, he fumbled "I'm sure it's in [my PC] somewhere. I just have to download it... You know, in my personal life, I don't set big goals."



According to the dustjacket blurb, Lowe places "the public statements of a major world figure under her microscope to build a fascinating picture of what he has said and what has been said about him." I'd argue that a few days spent trawling the web would give you everything you needed to know, minus the inane patter that Lowe uses as an excuse to rake in her publisher's advance. Read Robert Cringely's *Accidental Empires* and you'll see what proper research looks like when mixed with a healthy dose of industry experience. Give this one a wide berth.

Trawling the web would give you everything you needed to know

SUSAN PEDERSON

PCW DETAILS

★★

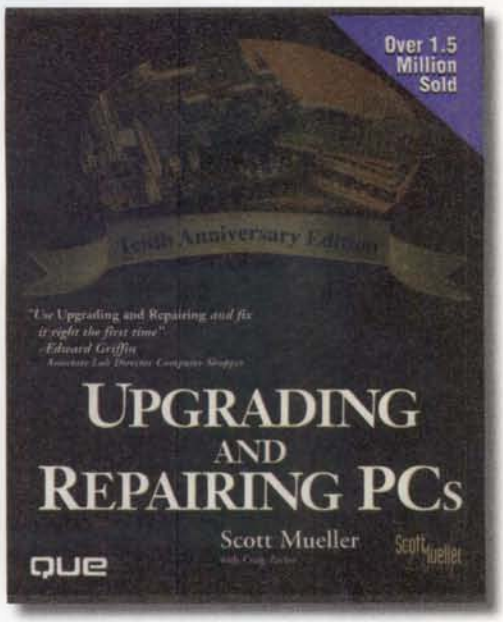
BILL GATES SPEAKS
Author *Janet Lowe*
Publisher *John Wiley & Sons*
ISBN *0-47-129-3539*
Price *£10.95*

Upgrading and Repairing PCs

I remember, way back at school, there was a mystical cupboard at the end of the computer room holding "The Winchester". Nobody could quite explain what it was. All we knew was that it ran the network and had a "massive" 30Mb storage capacity. Finally, I have the answer: Winchester is, in fact, a nickname given to a series of 30Mb hard drives made by IBM. Why "Winchester"? Nothing to do with where it was made, but instead named after a .30mm rifle. This, and countless other nuggets of useful and interesting information, can be found in the 1,584 hard-bound pages that go to make up the tenth anniversary edition of Scott Mueller's classic text, *Upgrading and Repairing PCs*.

A refreshing breather from some of the more hardcore technical manuals available

The work was originally written as course notes for his $1,300 seminars about the internal workings of a PC. With this edition, the second of two bundled CD-ROMs includes videos of his presentations and seminar documentation on no less than 3,600 drives and hundreds of other pieces of hardware. Mueller's writing style is a



PCW DETAILS

★★★★

UPGRADING AND REPAIRING PCS
Author *Simon Mueller*
Publisher *Que*
ISBN *0-78-971-6364*
Price *£51.49*

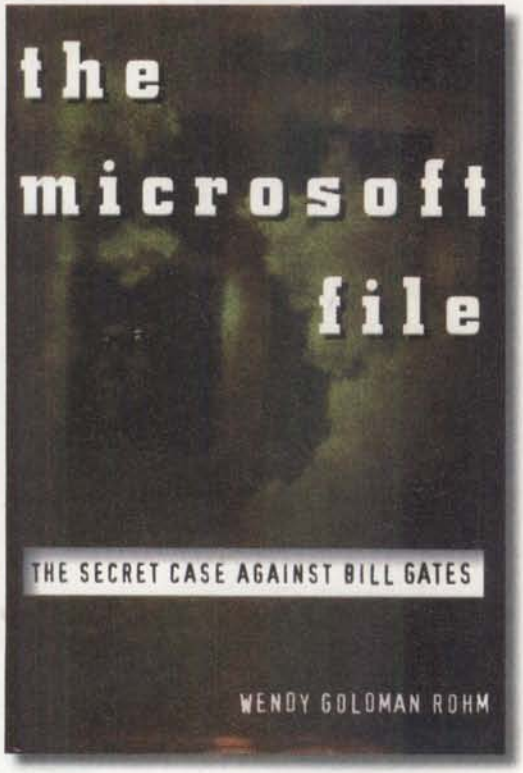
refreshing breather from some of the more hardcore technical manuals you are often likely to find, but it could also explain how he managed to write so many words; in certain places the "padding" is obvious. Experienced PC users may find it tiresome ploughing through this waffle, but should ultimately find the necessary reading a rewarding experience when they come across the comprehensively-explained facts.

The appendices comprise invaluable technical reference tables, but also demonstrate the book's transatlantic slant with a US-centric list of hardware suppliers that will be close to useless for a UK audience.

NIK RAWLINSON

The Microsoft File — The secret case against Bill Gates

This book claims to be a fly-on-the-wall account of Microsoft's inevitable ascent. We are told that information has come from "Deep Throat" sources as well as leaked emails and interviews with key personnel. Unfortunately, for the curious reader, that is as far as sourcing the claims goes. One wonders why author Rohm doesn't quote from the more accurate email exchanges she had with Gates prior to publication of the book, mentioned in her foreword. The author is undoubtedly at her best when digging the dirt on Microsoft. For instance, she reveals that code was found within early versions of Windows which would sabotage applications if users were running rival DR-DOS rather than MS-DOS.



There are some great windows into the mad Palace of Bill, my personal favourite being the moment when Gates loses his rag during an interview with CBS interviewer Connie Chung. But these are never followed through. Instead, the legal wranglings inside the Federal Trade Commission are covered in depth and too much space is given to sources such as Novell CEO Ray Noorda, presumably because they proferred far more information.

...information has come from 'Deep Throat' sources

Rohm definitely makes some basic points along the way, observing Microsoft's habit of dividing and destroying the competition until it dominates and then hiking-up prices, unhindered. There is a really superb book to be written on Gates' empire, but this isn't it. We'll have to keep on waiting.

PAUL TRUEMAN

PCW DETAILS

★★

THE MICROSOFT FILE — THE SECRET CASE AGAINST BILL GATES
Author *Wendy Goldman Rohm*
Publisher *Times Business*
ISBN *0-81-292-7168*
Price *£17.99*

TOP 10 books

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TSPNTB2

brainteasers

Quickie
Why will you always find a picture of Charles Dickens in a bank?

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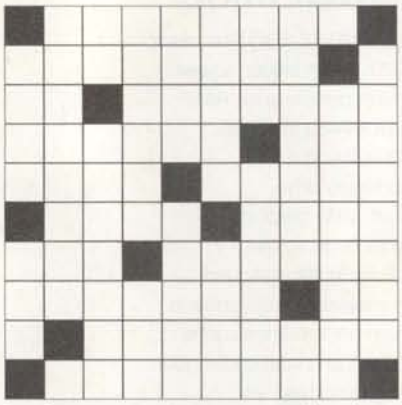
This month you will be pitting your wits against the Xmas number crossword. Arrange the numbers [*below*] into the grid [*right*], some across and some down, in the manner of a crossword.

16	2155	2980972
17	5091	5186811
88	5443	5401815
91	9181	8392650
258	11093	18983188
480	19603	27864111
482	32896	32832118
511	297091	37740183
689	465715	38451557
1512	542739	65961665
1851	917136	75019985



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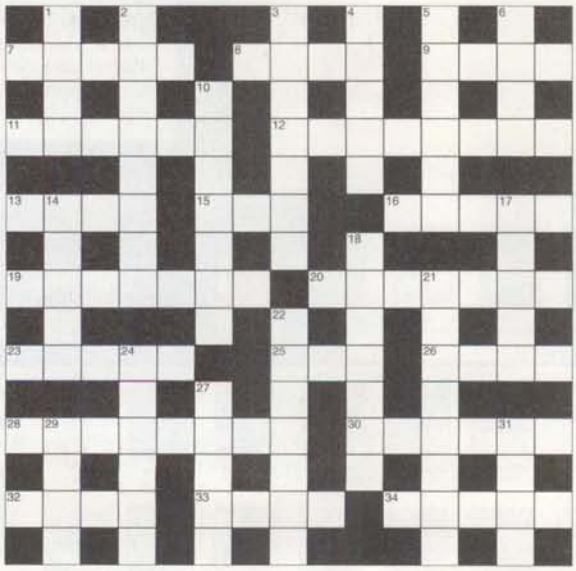
Usual condolences to the also-rans, but keep trying — as they say, next time it could be you!

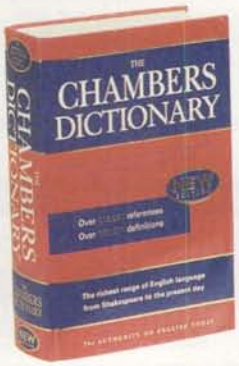
☛ I seem to have made a bit of a dog's dinner of November's problem. However, I'll try to have things sorted out by next month's issue.

JJ CLESSA

prize crossword



It's only words — and there are millions of them in the new Chambers Dictionary. Each month, one lucky *PCW* crossword entrant wins a copy. This time, you could get lucky. Send your completed crossword to: PCW November Prize Crossword, VNU House, 32-34 Broadwick Street, London W1A 2HG, to arrive no later than 4th January, 1999.
Please state clearly if you do not wish to receive promotional material from other companies.



ACROSS
7 The V of DVD (5)
8 Box in a table (4)
9 See 30 across
11 Disk division (6)
12 Microsoft's internet adventurer (8)
13 Island's programming language? (4)
15 Software glitch (3)
16 Time to reboot (5)
19 Visuals input device (7)
20 Existing setting unless another has been stated (7)
23 Screen dot (5)
25 19 across's text capability (inits) (3)
26 Electronic input-output point (4)
28 Rival of 12 across's company (8)
30 ...and 9 across peripherals plug-in point (6, 4)
32 ...and 34 sound card's real sound capability (9)
33 Place for expansion (4)
34 See 32 across

DOWN
1 Dumb show (4)
2 Hold back (8)
3 Retaliation (7)
4 Gradient (5)
5 Outcry (6)
6 Genuine (4)
10 Boy singers (7)
14 Character code (abbrev) (5)
17 Divide (5)
18 Sadden (7)
21 North African (8)
22 One way or another (7)
24 Spring festival (6)
27 Brief interval (5)
29 Verve (4)
31 Companion (4)

December solutions

ACROSS
7 Ethernet 9 Search 10 Help
11 Character 12 Turbo
14 Scanner 18 Start Up
19 Lithium 22 Refresh
24 Email 26 Intranets
28 Tray 29 Laptop
30 Provider

DOWN
1 Attenuate 2 Keep 3 Snack
4 Asia 5 Battle 6 Scar
8 Trance 13 Bar 15 Nail
16 Purr 17 Mutilated
20 Hem 21 Asleep
23 Estate 25 Ascot 26 Iran
27 Alps 28 Trip

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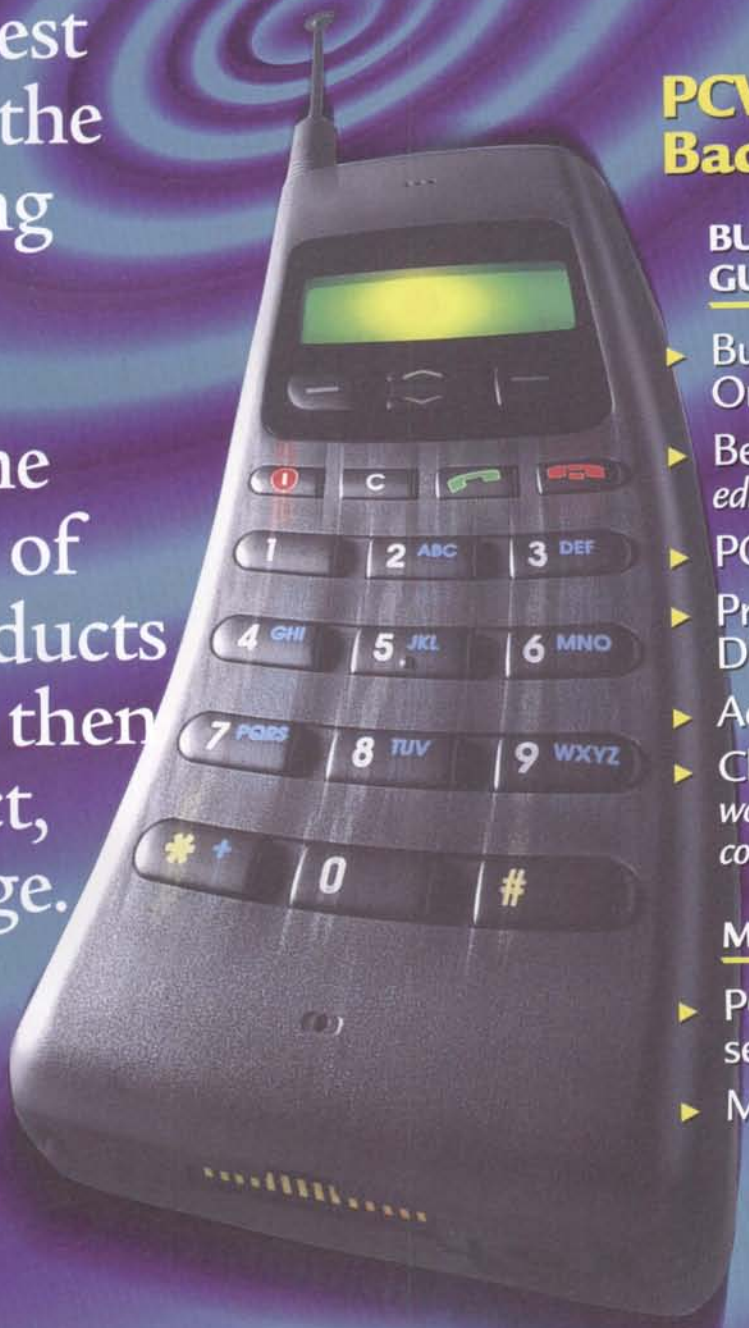

PCW's Back Pages

BUYER'S REFERENCE GUIDES

- Buying Advice and Mai Order Protection Tips
- Best Buys—*PCW's editors' recommendations*
- PCW Order Form
- Product Source Directory
- Advertiser Index
- ChipChat—*The last word, and the caption competition*

MICROMART

- PCW's Classified Ad section
- MicroMart Index

> **Dan has managed, yet again, to produce a machine that has an impressive specification and performs brilliantly ... you get a lot for your money.**
>
> dan Ultimate/200, Best Buy, What PC?, April '97

Service & Reliability User Survey August 1997 · dan Home Plus/200 PC Zone Classic September 97 · dan Xplora Plus/166 Editor's Choice September 97 · dan technology ltd 1997 Service Award October 97 · dan Home Plus/233 Best Buy October 97 · dan Ultimate/200XE Value November 97 · dantum II/266 Editor's Choice January 98 · Xplora Plus K6/233 Best Buys of '98 January 98 · dantum II 300/GS Performance February 98 · Readers' Customer Service Award 1997 April 98

1998 ANNUAL AWARDS

"THANK YOU"

To Everyone Who Voted For Us

We're proud of the numerous accolades we win for Dan Technology PCs month after month. And nothing gives us more pleasure than being up there amongst the winners of the magazines annual awards. Sometimes our votes come from expert journalists. With PC Direct, PCW, PC Pro and What PC?, recognition comes from the readers themselves. But wherever they come from, we're very grateful for these tributes to the efforts of our workforce. Thank You.

PC Pro Reliability & Service Awards 1998
Best Service Award
Best Reliability Award
WINNER: Dan Technology

PCW Service & Reliability Survey 1998
Desktops & Mobiles Category
WINNER: Dan Technology

PCW Annual Readers' Awards 1998
Most Reliable PC Manufacturer
WINNER: Dan Technology

PC Magazine Service & Reliability Survey 1998
Highest Satisfaction Award
Overall Winner Award
WINNER: Dan Technology

PC Direct Hits Awards 1998
Best Educational Systems
Best Network Servers
WINNER: Dan Technology

What PC? Readers' Awards 1998
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- DVD Drive with movie playback software (not available with Windows NT)
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- Microsoft Elite Natural Keyboard
- Dual Port SCSI Controller (Ultra & Wide)
- 1.44MB Floppy Disk Drive
- Windows 98 or 95 (please specify)
- Microsoft IntelliMouse™, Microphone
- Microsoft Works, Serif Page Plus, Quicken 6SE & Encarta US Encyclopaedia & MMX™ Software Bundle (5 titles)
- 1st Year On-Site Maintenance

EIDE Hard Disk Model

PENTIUM II 350	£1759	£2067	incl. VAT
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PENTIUM II 450	£2027	£2382	incl. VAT

Wide SCSI Hard Disk Model*

PENTIUM II 350	£2025	£2380	incl. VAT
PENTIUM II 400	£2150	£2527	incl. VAT
PENTIUM II 450	£2293	£2695	incl. VAT

Second CPU Option (for NT systems only)

Dual 350MHz CPU system	add £164 (£193 incVAT)
Dual 400MHz CPU system	add £289 (£340 incVAT)
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Monitor upgrade from 19" Monitor to:
21" Iiyama A102GT (19.8"view) add £440 (£517 incVAT)
Windows NT Workstation upgrade add £68 (£80incVAT)
10GB EIDE HDD upgrade from 8.0GB add £73 (£86incVAT)

dantum /200MMX Best Pro PC June 97 · Network Servers Winner June 97 · dan Home PC Best Budget PC June 97 · dantum /200MMX Gold Award June 97 · dan Ultimate/200X Best Buy April 97 · dantum 95/MMX200 Editor's Choice March 97 · dantum /166MMX Gold Award March 97 · dan Ultimate/200 Highly Commended February 97 · Home Plus/166 Performance February 97 · dan Home PC/166 Recommended January 97

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> **Dan's reputation for producing solid reliable machines is second to none and its latest effort is no exception.**
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> dan Home Plus, What Personal Computer, October '97

dan Ultimate +2DG Editor's Choice May 98	dantum II/333WSD Expert Buy May 98	Educational Systems Winner June 98	Home Systems Runner Up June 98	Pentium Pro Systems Runner Up June 98	dantum II/W5 Editor's Choice July 98	Overall Satisfaction Overall Winner August 98	dan Ultimate 350/98 Value September 98	dan Ultimate II/BX Recommended November 98	dan Ultimate II/450HS Recommended November 98

Popular Upgrades

Yamaha CRW4260t CD Rewritable

The Yamaha CRW4260t CD Rewritable is the answer to all your data storage, back-up and transfer needs. A "multi-media function" or 3-in-1 drive, no other storage medium is so cost effective or can be read by so many computer users world wide. The CRW4260t can write/overwrite CD-RW discs at 2x speed, CD-R discs at 4x speed, and read both formats, together with standard CD, at 6x speed. *(SCSI controller required)*

Yamaha CRW4260t Rewritable £ 238 (£280 inc VAT)

TEAC CD-R55S CD Writer

The perfect solution for archiving and distributing large amounts of information, the TEAC CD-R55S can write over 600MB of data (74 minutes of audio) to a single CD and boasts impressive performance speeds of 4x write/12x read *(SCSI controller required)*.

TEAC CD-R55S CD Writer £ 242 (£285 inc VAT)

Iiyama ProLite 36 LCD Monitor

Upgrade the 19" Monitor to:
Iiyama ProLite 36 Monitor
(14.1" TFT colour LCD @79MHz)
£ 285 (£335 inc VAT)

ATi All in Wonder Pro Video/TV Card

The All in Wonder Pro offers a comprehensive solution for industry-leading 2D acceleration, arcade quality 3D acceleration, image/video capture, output to TV and TV Teletext functions.

Upgrade the Xpert'98 video card to:
ATi All in Wonder Pro 8MB AGP £ 47 (£ 56 inc VAT)

Creative Sound Blaster Live!

Upgrade the Sound Blaster AWE 64 to:
Creative Sound Blaster Live!
"The most powerful consumer-orientated PC sound card to date, at an enticing price"
£ 103 (£121 inc VAT)

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requires TV Card pre-installed

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Desktop Video Camera £ 71 (£ 84 inc VAT)

TV cards & modems will only work in the UK.

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dan on the web
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YEAR 2000 COMPLIANT
All Dan PCs are year 2000 compliant

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ISO 9002/EN 29002 (BS 5750 Pt 2)

Delivery cost to mainland UK for one system is £23.

dantum/200 Best Buy January 97	Home Plus/133 5 Star Award December 96	dantum/133 Editor's Choice December 96	dantum/133 Best Buy December 96	dantum /133 Highly Commended December 96	dantum /200 Editor's Choice December 96	dantum /200 Best PC 1996 Awards	dantum /s Best Home PC 1996 Awards	dantum /166 Performance November 96	dantum 95/133 Recommended September 96

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Home and Internet PCs

Network Servers Winner June 97 · dantum/200MMX Gold Award June 97 · dan Ultimate/200X Best Professional PC June 97 · dan Home PC Best Budget PC June 97 · dantum/166MMX Gold Award March 97 · dan Home Plus/233 Best Buy October 97 · dan Ultimate/200XE Value November 97 · dantum II/266 Editor's Choice January 98 · Xplora Plus K6/233 Best Buys of '98 January 98 · dantum II 300/GS Performance February 98 · dantum II/17B Top 50 Entry March 98 · Reader's Customer Service Award April 98

Dan offers a range of models of PC that have been specially designed for home use by the whole family. Ultilising Intel's Celeron and Pentium®II processors, these systems take PC power to its limit. Each system includes multimedia kits, fax modems and collections of software titles. Younger children can enjoy games and educational programs and older ones can do their homework, listen to music, or use an encyclopedia. Adults can use a word processor, spreadsheet and database, send and receive faxes and e-mail or get connected to the Internet.

YEAR 2000 COMPLIANT — Dan PCs are guaranteed Year 2000 compliant

6.4GB Hard Disk · VoiceFax Modem 56KBPS · 64MB PC100 SDRAM · 32MAX SPEED CD-ROM · AWE 64 Sound BLASTER

Save on MS Office 97

MS Office 97 for Students £107 (£126 incVAT)

CE

Choose one of the two software packs with the Dan Home II Plus PC

Dan MM Software Pack 1: Serif Page Plus, MS Plus for Kids, MS School Bus (Dinosaurs), Musical Instruments, 3D Movie Maker, Hellbender, Creative Writer & MS CD Sampler.

or

Dan MM Software Pack 2: Serif Page Plus, AutoRoute Express, Art Gallery, Multimedia Golf, Entertainment Pack & MS CD Sampler.

dan Home II Plus

Includes 1 Year On-site Warranty

with Celeron or Pentium II Processor

- 64MB PC100 SDRAM (1x64MB)
- 6.4GB EIDE HDD
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATi 8MB All in Wonder Pro AGP Card
- 17" SVGA L/R N/I Monitor (Viewable size 16.2" / 400mm)
- 56KBPS VoiceFax/Modem (UK only)
- 32MAX Speed EIDE CD-ROM
- Soundblaster AWE 64 OEM
- Dan Hi-Fi Power Speakers (150W PMPO)
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Microsoft IntelliMouse™
- Windows UK Keyboard
- MS Sidewinder Joystick, Microphone
- Windows 98 or 95 (please specify)
- MS Works, Encarta US,
- Intuit Quicken 6SE, MMX Software Bundle & Dan MM Software package 1 or 2
- 1 Year On-site Warranty

BUY NOW PAY 1999 — APR 29.9%

CELERON 300A	£ 1041	£ 1224	incl. VAT	£ 57.81
CELERON 333	£ 1057	£ 1242	incl. VAT	£ 58.64
PENTIUM II 350	£ 1098	£ 1291	incl. VAT	£ 60.92
PENTIUM II 400	£ 1223	£ 1438	incl. VAT	£ 67.73

BEST BUY · WHAT PC?

"We sensed from the outset that Dan's submission would be a high quality one. Opening the box reveals a neatly packaged collection of components and extras as opposed to the all too common tombola affair. The midi tower case has useful slide off access panels. Removing the left panel revealed one of the cleanest system designs we have ever seen. Not one cable crosses the motherboard, as they're all sited in one corner next to the vital components they serve to connect... A predictably good system from Dan, and one that almost perfectly balances cost against features and performance. Dan's Home Plus deservedly takes the honours."
WHAT PC, **Best Buy** *(dan Home Plus/233), Oct'97*

Popular Upgrades

		incl. VAT
Additional 32MB PC100 SDRAM	£ 31	(37)
Additional 64MB PC100 SDRAM	£ 66	(78)
8.0GB HDD upgrade from 6.4GB	£ 16	(19)
17" CTX 1769SE monitor upgrade from Dan SVGA 15" monitor	£ 66	(78)
Microsoft Joypad	£ 18	(22)
Upgrade the Dan Hi-Fi Speakers to:		
Yamaha YST-M20 Speakers	£ 22	(26)
dan Subwoofer & Speakers	£ 14	(17)

Panasonic SuperDisk120

Panasonic SUPER 120MB DISK

The Superdisk120 is a high capacity 3.5inch drive capable of reading and writing to 120MB disks whilst offering full backwards compatibility with conventional 3.5inch disks. It provides 83 times more data storage capacity and up to five times faster data retrieval than current floppy drives. The Superdisk120 is ideal for use in desktops, workstations and servers for rapid backup and transfer of text and multimedia files, software distribution and Internet downloading.

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Immerse yourself in sound so vivid, you *experience* games and music rather than just hear them! Features include superior surround-sound Environmental Audio, 256 voices of music synthesis and real time audio enhancement, and Environmental Audio Extensions.

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dan GameStation

Includes 1 Year On-site Warranty

with Celeron or Pentium II Processor

- 64MB PC100 SDRAM (1x64MB)
- 8.0GB EIDE Ultra DMA HDD
- Choice of Intel® Celeron or Pentium®II Processor with Cache
- ATi 8MB All in Wonder Pro AGP Card
- Diamond 8MB Monster 3DII Sport
- 17" Iiyama L/R N/I Monitor (A701GT) (Viewable size 16.2" - 405mm)
- 56KBPS VoiceFax/Modem (UK only)
- DVD Drive with movie playback software
- Soundblaster AWE 64 OEM
- Dan Subwoofer & Speakers
- 1.44MB Floppy Disk Drive
- Midi Tower Case with PSU
- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Microsoft IntelliMouse™
- Windows UK Keyboard
- MS Sidewinder Joypads (x2), Microphone
- Windows 98 or 95 (please specify)
- MS Works Suite, Encarta US, Intuit Quicken 6SE, Serif Page Plus, MMX™ Software Bundle (5 titles), World Cup '98 & Formula 1 '97
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Monthly Payment Option BUY NOW PAY 1999 APR 29.9%

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PENTIUM II 350	£ 1471	£ 1729	incl. VAT	£ 81.22
PENTIUM II 400	£ 1596	£ 1876	incl. VAT	£ 88.04
PENTIUM II 450	£ 1739	£ 2044	incl. VAT	£ 95.82

dan Xplora II Plus

Includes 1 Year On-site Warranty

High end INTERNET PC

- 32MB PC 100 SDRAM (1x32MB)
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- 32MAX Speed EIDE CD-ROM
- SoundBlaster AWE 64 OEM
- Dan Hi-Fi Power Speakers (150W PMPO)
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- 1 Parallel, 2 Fast Serial & 2 USB Ports
- Microsoft IntelliMouse™
- Windows UK Keyboard
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- Windows 98 or 95 (please specify)
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- 56KBPS VoiceFax/Modem (UK only)
- 32MAX Speed EIDE CD-ROM
- Soundblaster 16 Soundcard
- Dan Advanced Speakers (10W PMPO)
- 1.44MB Floppy Disk Drive
- Desktop Case with PSU
- Microsoft IntelliMouse™
- Windows UK Keyboard
- Microphone
- Windows 98 or 95 (please specify)
- 1 Parallel & 2 Fast Serial Ports
- MS Works Suite, Intuit Quicken 6SE & MMX™ Software Bundle (5 titles)
- 1 Year On-site Warranty

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Personal Computer World Editors Choice

"We judged the PCs in this month's group test on three main criteria: performance, price and internet readiness...There is usually quite a bit of hand-wringing over our Editor's Choice award, but not this month. Sheer value for money, performance and a no-strings internet access trial means that this month's winner just had to be the Dan Xplora Plus/166XT. It is well built, well specified and is one of the few machines to be truly internet ready. Superb."

PCW, **Editor's Choice** *(dan Xplora Plus/166XT), Sept'97*

★ WINNER ★ PC Personal Computer World Service & Reliability Survey 1998

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1998 Service & Reliability Award

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included as standard in Dan Home II Plus & GameStation

Customers who are looking for the ultimate in multimedia graphics and video capabilities in a single card need look no further than the All in Wonder Pro from ATi. Based on ATi's latest 3D Rage Pro processor and available in both PCi and AGP formats, the All in Wonder Pro offers just about the most comprehensive solution there is for industry-leading 2D acceleration, arcade-quality 3D acceleration, video capture, output to TV and TV Teletext functions that let users exploit TV content, rather than simply watch it.

ATi's All in Wonder Pro functions include:

- Rage Pro powered 2D/3D graphics acceleration
- Still image and motion video capture
- Video playback software
- Intelligent TV Tuner
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Adaptec PCI 3940 UW SCSI controller	£ 342	(402)
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Iomega 100MB ZIP Cartridge	£ 7	(9)
Iomega 2GB JAZ Internal SCSI Drive	£ 215	(253)
Iomega 2GB JAZ Int. SCSI Drive + controller	£ 263	(310)
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Video Cards

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ATi Xpert@Work PCI 4MB SGRAM	£ 38	(45)
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PCI 32-bit 3COM900 Combo Network Card	£ 50	(59)
8-port 10 base-T mini Ethernet Hub	£ 29	(35)
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Internal 56.6KBPS Voice Fax Modem	£ 68	(80)
Internal 56.6KBPS Voice Fax Modem + camera	£ 117	(138)
External 56.6KBPS Voice Fax Modem	£ 104	(123)
Sportster External 56.6KBPS Flash Fax Modem	£ 110	(130)
US Robotics External 56.6KBPS Message Plus	£ 150	(177)
Pace ISDN Terminal Adapter	£ 217	(255)

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CPUs/Motherboards

CPUs

IBM 686MX 300MHz	£ 51	(60)
IBM 686MX 333MHz	£ 87	(103)
AMD K6-2 300MHz	£ 59	(70)
AMD K6-2 350MHz	£ 102	(120)
Intel Celeron 300	£ 84	(99)
Intel Celeron 300A	£ 107	(126)
Intel Celeron 333	£ 123	(145)
Intel Pentium II 333MHz	£ 140	(165)
Intel Pentium II 350MHz	£ 164	(193)
Intel Pentium II 400MHz	£ 289	(340)
Intel Pentium II 450MHz	£ 432	(508)

Motherboards

PCI AT Pentium ALI w/512K Cache (Asus)	£ 57	(67)
PCI Pentium II BX (Asus)	£ 79	(93)
PCI Pentium II BX (Supermicro)	£ 79	(93)
PCI Dual Pentium II BX w/SCSI Controller	£ 206	(243)
PCI Dual Pentium II GX w/SCSI Controller	£ 258	(304)

Multimedia Devices

32max Speed IDE CD-ROM	£ 33	(39)
32x Speed SCSI CD-ROM	£ 61	(72)
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TEAC CD-R55S CD Writer *(controller required)*	£ 242	(285)
Yamaha CD-Rewritable 4260 *(controller required)*	£ 238	(280)
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Sound Blaster 16	£ 15	(18)
Sound Blaster AWE 64 (OEM)	£ 28	(33)
Sound Blaster AWE 64 Gold	£ 79	(93)
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dp Subwoofer + Speakers	£ 30	(36)
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ATi All in Wonder Pro AGP 8MB	£ 77	(91)

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Hauppauge PCi WinTV Card	£ 59	(70)
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21" iiyama A102GT SVGA Colour Monitor DiamondTron, .28ag, 1800x1440 @ 75KHz	£ 747	(878)
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15" CTX 1569UA Colour Monitor Trinitron, .25ag, 1024x768 @ 85KHz	£ 154	(181)
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BJC4300	£91.00	£106.93
CANBJC4300+Scanner	£121.00	£142.18
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BJC5000 A3 1440 dpi	£165.00	£193.88
BJC50 Colour	£188.00	£220.90
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MPB3064AT-UD 6.4Gb	£106.00	£124.55
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Mess/Plus 56k V90 Ext	£89.00	£104.58
V90 56k PCMCIA Mhertz	£103.00	£121.03
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SHARP UX-108		(THERMAL)	·NEW £99
SHARP UX-178		(THERMAL)	·NEW £115
SHARP UX-258	**TAM**	**(THERMAL)**	·NEW **£149**
SHARP FO-1460M		(INK FILM)	£185
SHARP FO-1660M	**Multi Function**	**(INK FILM)**	**£199**
SHARP FO-3600M		(LASER)	·NEW £429
SHARP FO-3500M		**(LASER)**	·NEW **£619**

WE STOCK FULL RANGE OF FAX MACHINE SUPPLIES
INCLUDING FAX ROLLS, INK FILMS, INK CARTRIDGES & LASER TONERS

INKJET & LASER PRINTERS & SCANNERS

HP DESKJET 690C £96

COLOURSMART PHOTO PRINTING

- Prints up to 5 ppm black and 1.7 ppm colour
- 600 x 600dpi black and 600 x 300dpi colour
- HP RealLife Imaging System • 30 TrueType Fonts
- Includes Photo Colour cartridge

3 Years on Site £40
HP Black Cartridge 51629A £16
HP Colour Cartridge 51649A £17
HP Photo Cartridge C1816A £23

HP DESKJET 420C		(INKJET)	·NEW £66
HP DESKJET 340C		(INKJET)	£135
HP DESKJET 710C		**(INKJET)**	·NEW £134
HP DESKJET 720C		**(INKJET)**	**£149**
HP DESKJET 2000C		(INKJET)	·NEW £450
HP DESKJET 2000CN	NETWORK	(INKJET)	·NEW £675
HP DESKJET 2500C		(INKJET)	·NEW £705

HP LASERJET 1100 £232

Copy and Scan with Your Printer

- Up to 8ppm Print Speed • 2 Mb Memory with MEt
- 600dpi Resolution with Ultra Precise Toner
- 100 Sheet Input Tray • Straight Through Paper Path
- DOS/Windows 3.1x/Windows 95/Windows NT 4 Compatible
- 1 Year Return to HP Warranty

HP LASERJET 1100A Laser/Copier/Scanner Plus all the Features of Laserjet 1100 £285
3 Years on Site £77
HP Laserjet 1100/1100A Toner (C4092A) £36

HP LASERJET COMPANION		(COMPANION)	£79
HP LASERJET 5000		**A3 (LASER)**	·NEW **£929**
HP LASERJET 5000N		A3 (LASER)	·NEW £1334
HP LASERJET 5000GN		A3 (LASER)	·NEW £1649
HP LASERJET 8000		**(LASER)**	·NEW **£1574**
HP LASERJET 8000N		(LASER)	·NEW £1762
HP LASERJET 8000DN		(LASER)	·NEW £2062

HP DESKJET 895Cxi £186

PREMIUM PRINTING HIGH PERFORMANCE

- Up to 9ppm Mono, 6ppm colour & 0.18ppm Photo
- 600 dpi Resolution
- 100 Sheet Input Tray
- HP Photo REt II for Photo Quality Colour
- 1 Year HP Unit Exchange Warranty

3 Years on Site £66
HP Black Cartridge 51645A £17
HP Colour Cartridge C1823A £21

HP SCANJET 4100C		(SCANNER)	·NEW £115
HP SCANJET 5100C		(SCANNER)	£149
HP SCANJET 6200C		**(SCANNER)**	·NEW **£237**
EPSON STYLUS COLOR 440		**(INKJET)**	·NEW **£103**
EPSON STYLUS COLOR 640		**(INKJET)**	·NEW **£133**

HP LASERJET 6P £460

PERSONAL QUALITY LASER PRINTER

- Superb 600x600dpi with HP REt
- 8ppm engine
- Excellent graphics with min. 128 levels of grey
- Dual paper bins and manual option
- PC parallel port and infra-red

HP Laserjet 6MP £562
3 Years on Site £142
HP Laserjet 6P Toner (C3903A) £45

HP COLOR LASERJET 4500		PCL (COLOR LASER)	·NEW £1875
HP COLOR LASERJET 4500N	**Network**	**(COLOR LASER)**	·NEW £2130
HP COLOR LASERJET 4500DN	Postscript	(COLOR LASER)	·NEW £2610

WE STOCK FULL RANGE OF INKJET & LASER PRINTER SUPPLIES FOR BROTHER, CANON, HP, KODAK, LEXMARK, MT, OLIVETTI, XEROX ETC.

EPSON STYLUS COLOR 740 £177

The state of the art inkjet printer for advanced home and business users

- EPSON Ultra MicroDot - the world's smallest ink droplet Black and colour
- 1440dpi with EPSON Variable-Sized Droplet Technology
- Advanced PhotoReal colour printing •40% speed improvement
- Parallel, serial and USB interface - windows & macintosh
- Optimised for plain paper printing

EPSON Black Cartridge S020189 £16
EPSON Colour Cartridge S020191 £16

HP LASERJET 4000 £710

OFFICE STANDARD PRINTER

- Fast 16ppm print speed • PCL6 printer language
- 1200dpi with REt and microfine toner
- HP JetAdmin printer management software

HP Laserjet 4000T £787
HP Laserjet 4000N £914
HP Laserjet 4000TN £990
3 Years on Site £180
HP 4000 Standard Toner (27A) £59
HP 4000 High/Cap Toner (27X) £85

LOWER PRICES ON ALL INKJET & LASER PRINTERS & PRINTER CONSUMABLES

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LOWER PRICES ON ALL INKJET & LASER SUPPLIES & PAPER MEDIA

CANON SUPPLIES

CANON INK CARTRIDGES		Black	Colour
Canon BN22/32	(BJI101)	£5 P/H	£25
Canon BJ130	(BJI481)	£11	
Canon BJ300/330	(BJI642)	£9	
Canon BJ10E/EX20	(BC01)	£12	
Canon BJ200/E/X/230	(BC02)	£12	
Canon 210/240/250	(BC02/05)	£13	£17
Canon 240/250 Photo Cart.	(BC06)	£14	KIT £23
Canon 240/250 . Flourescent	(BC09F)		£21
Canon BJ30/70/80	(BC10)	£22	
Canon BJ30/70..TANKS 3's	(BC10)	£10	
Canon BJ70/80	(BC11)		£26
Canon BJ70/80. TANKS 3's	(BCI11)	£10	£14
Canon BJC600 ...	(BJI201BK/C/M/Y)	£5	£5
Canon BJC600 Series SET OF COLOURS			£18
Canon BJC600 or 610/620 PRINTHEAD			£82
Canon BJC800	(BJI643)	£13	£16
Canon BJC4000 Series	(BC20/21E)	£19	£25
Canon BJC4000 .... TANKS	(BCI21)	£5	£13
Canon 42/4300/45/4650 Photo Cart	(BC22E)		£20
Canon 42/4300/45/4650 Photo Kit	(BC22Kit)		£25
Canon 42/4300/45/4650 Flourscent	(BC29F)		£21
Canon BJC7000	(BC60/61)	£22	£24
Canon BJC7000 ... Colour Ink Tank	(BCI61)		£15
Canon BJC7000	(BC62)		£33
CANON INKJET MEDIA	A4		A3
Coated Paper	(200) (LC101)	£20	£35
DoubleSidedCoated	(200) (LC301)	£12	£25
High Resolution	(200 / 100) (HR101)	£17	£17
Glossy Paper ..	(A4-20/A3-10) (GP201)	£7	£7
High Gloss Film	(20) (HG101)	£16	£36
High Gloss Photo Film	(10) (HG201)	£14	
Iron-on-Transfer	(A4-10/A3-5) (TR201)	£12	£12
Transparency	(50) (CF102)	£30	
Back Print Film	(20) (BF102)	£23	£46

INKJET FAX SUPPLIES

Canon B100/110/MP10	(BX3)	£20	
Canon B320/340/360	(BX2)	£15	
Canon B200/200S	(BC01)	£12	
HP Officejet 590/635.	(51629A/49A)	£16	£17
Panafax UF300	(PC60BK)	£21	
Panafax UF342/44	(3502/03)	£26	£40
Samsung SF4200	(1380620/19)	£21	£26
Toshiba TF461	(1380620/19)	£21	£26

EPSON SUPPLIES

EPSON INK CARTRIDGES		Black	Colour
Stylus Col. Pro XL	(20034/20036)	£10	£19
Stylus Pro XL+	(20034/20066)	£10	£20
Stylus Col. II/IIS/820.	(20047/20049)	£13	£18
StylusPhoto/700/EX	(20093/20110)	£14	£14
Stylus 200	(20047/20097)	£13	£18
Stylus 300 (4 Colour Cart.)	(20138)		£15
Stylus 500	(20093/20097)	£14	£18
Stylus 400/600	(20093/20089)	£14	£14
Stylus 800/1520	(20108/20089)	£14	£14
Stylus 440/640	(20187/20191)	£15	£16
Stylus 740	(20189/20191)	£16	£16
Stylus 1500	(20062/20049)	£32	£18
Stylus 3000 .	(20118/C130/M126/Y122)	£34	£38
Stylus 5000 Pro..	(20118/C147/M143)	£34	£38

EPSON INKJET PAPER MEDIA

A6 Photo Glossy Film	(10) (S041107)	£3
A6 Photo Inkjet Card	(50) (S041054)	£6
A6 Photo Sticker Paper	(5) (S041144)	£4
4" x 6" Photo Paper	(20) (S041134)	£5
5" x 8" Photo Inkjet Card	(30) (S041121)	£5
8" x 10" Photo Inkjet Card	(30) (S041122)	£12
A4 Photo Adhesive Paper	(10) (S041106)	£8
A4 Glossy	(15) (S041071)	£20
A4 Photo Glossy	(20) (S041126)	£6
A4 Photo Paper	(20) (S041140)	£8
A4 720/1440 Dpi	(100) (S041061)	£9
A4 360 Dpi	(100) (S041059)	£7
A4 Iron on Transfer	(10) (SE41001)	£11
A4 Transparency	(30) (S041063)	£32
A3 Glossy	(10) (S041073)	£36
A3 Photo Glossy	(20) (S041125)	£16
A3 Photo Paper	(20) (S041142)	£19
A3 720/1440 Dpi	(100) (S041068)	£25
A3 360 Dpi	(100) (S041065)	£17
Super A3 Glossy	(10) (S041074)	£45
Super A3 720/1440 Dpi .	(100) (S041069)	£27
Super A3 360 Dpi	(100) (S041066)	£20
A3+ Photo Glossy	(20) (S041133)	£18
A3+ Photo Paper	(20) (S041143)	£23
A2 Photo Glossy	(20) (S041123)	£32
A2 720/1440 Dpi	(30) (S041079)	£22
A2 360 Dpi	(30) (S041078)	£17
A2 Panoramic Photo	(10) (S041145)	£11
13"x19" Iron Transfer	(10) (SE41003)	£69

HP SUPPLIES

HP INK CARTRIDGES		Black	Colour
HP Deskjet Portable	(51633/25)	£14	£17
HP D/Jet 500 Series	(51626/25)	£16	£17

HP DESKJET 500 SERIES BLACK
3 x 26A Ink Cart @ £15.65 £46.95

HP D/Jet 600 Series	(51629/49)	£16	£17
HP D/Jet 690 Photo Cart.	(C1816A)		£23
HP 820/50/70/1100	(51645A/41A)	£17	£18
HP 720/890/1120 .	(51645A/C1823A)	£17	£21
HP Deskjet 1200	(51640A/40C/Y/M)	£18	£19
HP Deskjet 1600	(51645A/40C/Y/M)	£17	£19
HP D/Jet 2000	(C4844/41C/42Y/43M)	£24	£24
HP PhotoSmart Printer	(C3844/45A)		£26
HP P/Jet XL300	(51639A/39 C/Y/M)	£15	£17

HP A4 INKJET PAPER MEDIA

HP Premium Inkjet Paper	(200) (51634Z)	£12
HP Premium GlossyPaper.	(10) (3831A)	£7
HP Premium Heavy Weight	(100) (1853A)	£11
HP Premium Glossy	(50) (3837A)	£30
HP Premium Photo	(15) (6040A)	£7
HP BrightWhite Inkjet	(200) (5977A)	£5
HP Bright White Paper	(500) (1825A)	£9
HP Photo Paper (Deskjet 690)	(20) (1847A)	£7
HP DeluxePhotoPaper	(890C)(20) (6057A)	£10
HP Banner Paper. 90g/2Fold	(100) (1821A)	£8
HP Greeting Card A4	(20) (6042A)	£6
HP Premium Transparency	(20) (3832A)	£13
HP PremiumTransparency	(50) (3835A)	£27
HP Iron-On T-Shirt Media .	(10) (6050A)	£11

HP A3 INKJET PAPER MEDIA

HP Bright White Paper	(200) (1858A)	£15.50
HP Premium Inkjet Paper .	(100) (1856A)	£19.50
HP Premium Photo Paper .	(20) (6059A)	£23.50

OTHER SUPPLIES

		Black	Colou
Apple Stylewriter I/II	(APM8041G)	£14	
Brother HJ100/400	(BRIN10)	£21	
Brother HJ770	(BRIN20)	£16	
Brother MC3000/MFC700 .	(LC01)	£13 . C/Y/M	£9
Kodak Diconix 150/180/330C .		£10	£15
Lexmark Winwriter150	(1380620/19)	£21	£25
Lexmark PS4079	(1380490/1C/2Y/3M)	£15	£26
Lexmark 1020/2030 .	(1380620/19)	£21	£25
Lexmark 2050/2070	(1382050/60)	£24	£26
Lexmark 5000/7000	(12A1970/80)	£19	£23
Olivetti JP50/70/90		£24	
Olivetti JP50/70/90Head+3Refills		£28	
Olivetti JP150/170/350 Series		£19	
Olivetti JP170/190/360/450		£19	£29
Olivetti JP150 Head+4 Ink Tanks		£39	
Olivetti JP790 High Resolution Block		£25	£36
Olivetti JP790 Printhead+1Refill		£32	£42
Olivetti JP790 Refills (2's)		£15	£21
Xerox XJ4C/XJ6C Work Home Centre		£12 C/Y/M	£12
Xerox 3006	(8R7638)	£46	
THERMAL		Black	Colou
Alps MD-1000/2010/2300/4000		£4	£9
Citizen Printiva 600/700/1700		£4	£9

INKJET REFILLS (2's)

Jetfill Epson Stylus800	Refills 2's	£16
Jetfill Canon BC01/02	Refills 2's	£16
Jetfill HP DJ-500/600	Refills 2's	£15

MISC. LASER/INKJET

Copy Speed Paper	(80gsm) (2500)	£26
PlusJet Paper	(90gsm) (500)	£6
Matchmaker Paper	(100gsm) (500)	£9
Business Cards White or Ivory	350's	£7
3M Laser Film Unbacked (50)	(CG3300)	£12
3M Laser Film Paper Backed (50)	(CG3360)	£13
HP Laser Transparency (50) .	(92296U)	£14

PHOTO INKJET PAPER	15's	50'
Kodak A4 Letter Weight Paper	£9	£24
Kodak A4 Photo Weight Paper	£9	£24
Kodak A3 Photo Weight Paper		£38

3M INKJET TRANSPARENCY (A4)

3M Films Epson/Canon Colour	(50)(CG3410)	£26
3M Films HP Deskjet/Paintjet	(50)(CG3460)	£24
3M Films Canon/Dec/Epson/HP	(50)(CG3480)	£24

LASER PRINTER • TONERS • DRUMS • PHOTOCONDUCTORS • DEVELOPERS • FUSERS

*Photoconductor Unit / **Fuser Units		TONER	DRUM
Apple Laserwriter Select 300/310/360 .	(M1960G/A)	£75	
Apple Personal Laserwriter NT/NTR/SC .	(M0089L)	£66	
Apple Personal Laserwriter 300/320	(M2045G/A)	£58	
Brother HL630/660/FAX5000P/6000	(TN/DR100)	£19	£89
Brother HL730/760/FAX8000P/9000	(TN/DR200)	£18	£95
Brother HL820/1050/1060	(TN/DR300)	£19	£99
Brother HL1260/1660	(EP-CARTRIDGE)	£78	
Brother HL2400 Colour Laser	(TN01 BLACK)	£86 CYM	£69
Canon CLBP 360PS Colour Laser	(EPH-BLACK)	£59 CYM	£69
Canon LBP2460	(EPW)	£109	
DataProducts LZR 650/900/960/965		£32	£99
Epson GQ3500/GQ5000	(RICOH 6000) (5760/5793)	£16	£119
Epson EPL3000	(S051020)	£73	
Epson EPL4000/4100/4300	(S051002/51005)	£85	*£119
Epson EPL5000/5100/5200	(S051011)	£92	
Epson EPL5500	(S050005/51029)	£28	*£42
Epson EPL5600/EPL-N1200	(S051016)	£68	
Epson EPL-N2000	(S051035)	£140	
Epson EPL5700	(S051010/51055)	£58	*£40
Epson EPL7100/7500/8000/8100	(S051009)	£131	
Epson EPL9000 / 9100	(S051022)	£149	
Fujitsu VM800 Process Cartridge		£122	**£195

*Photoconductor Unit / **Fuser Units		TONER	DRUM
HP Laserjet II / IID / III / IIID	(92295A)	£42	**£159
HP Laserjet IIP / IIIP	(92275A)	£49	**£149
HP Laserjet 4L / 4ML / 4P / 4MP	(92274A)	£39	**£179
HP Laserjet 5L/6L/3100	(C3906A)	£36	
HP Laserjet 1100/1100A	(C4092A)	£36	
HP Laserjet 5P / 5MP / 6P / 6MP	(C3903A)	£45	
HP Laserjet 4/4M/4+/5/5N/5M ..	Standard (92298A)	£54	**£179
HP Laserjet 4/4M/4+/5/5N/5M	High Cap. (92298X)	£60	**£179
HP Laserjet IIISi / 4Si	(92291A)	£62	**£269
HP Laserjet 4V / 4MV	(C3900A)	£79	
HP Laserjet 5Si	(C3909A)	£95	
HP Laserjet 4000 Series	Standard (C4127A)	£59	
HP Laserjet 4000 Series	High Cap. (C4127X)	£85	
HP Laserjet 5000 Series	High Cap. (C4129X)	£109	
HP Color Laserjet 5	Black (C3105A)(C02/Y03/M04A)	£5 CYM	£25
IBM 4019/28/29/WinWriter 600	(High Yield-1380520)	£145	
IBM 4039 / 3916	(High Yield-1380950)	£149	
IBM Lexmark Optra/L/4039	(High Yield-1382150)	£155	
IBM Lexmark Optra N	(High Yield-1382140)	£145	
Kodak Ektaplus 7008		£20	£89
Kodak Ektaplus 7016		£89	*£65
Kyocera FS1550 / 1600	(TK12)	£36	

*Photoconductor Unit / **Fuser Units		TONER	DRUM
Mannesmann Tally MT904/908	(Pack of 2)	£18	£75
Mannesmann Tally MT905 or MT906	(Pack of 2)	£18	£85
Nec Silentwriter S60P/S62P/S102P		£119	
Nec SuperScript SS610		£84	
Oki Okipage 4W	(5089/5096)	£18	£85
Oki OL100/400/800/30/40/50/70	(4452/4459)	£20	£145
Oki Laser OL400E / 410E-EX	(4851/4858)	£15	£129
Olivetti PG306/308/404*/408*	(82376x2/82377/82505*)	£24	£99
Panasonic KXP4400/4401/5400 .	(KXP455/PDM6)	£10	£55
Panasonic KXP4420	(KXP451/PDM2)	£25	£57
Panasonic KXP4410/4430/4440	(KXP453/PDM5)	£24	£75
Panasonic KXP4450/4451/4455	(KXP450/PDM1)	£20	£75
Panasonic KXP6100/6150	(KXP457/PEP3)	£12	£105
Panasonic KXP6300/6500	(KXP459/PEP5)	£12	£115
Panasonic KXP7200	(PEP6)	£145	
Ricoh PC 6000 / Oki Laserline 6..	(6000TC/6000DPC)	£12	£85
Ricoh LP1200	(G728-05/1200DK)	£85	£99
Sharp JX9200/9210	(JX92TC/92DR)	£39	*£57
Sharp JX9400/9460/9600/9660	(JX96DC/DR)	£69	£75
Sharp JX9500	(JX95TC/95DR)	£32	*£85
Star WinType 4000 EPX-B	(ST87339430)	£68	
Texas Instruments MicroLaser	(2559879/81)	£32	£95

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	1's	5's
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3M TR1 Travan 400Mb	£12	£58
3M TR2 Travan 800Mb	£22	£107
3M TR3 Travan 1.6Gb	£17	£83
3M TR4 Travan 4Gb	£20	£97
3M TR5 Travan 5Gb	£20	£97
3M TR NS8 Travan 8Gb	£23	£112
3M TR NS20 Travan20Gb	£28	£135
HP TR5 Travan 5000Mb	£21	£102
SONY Q-Wide Cartridges	1's	5's
SONY QW5122F 240Mb	£9	£44
SONY QW3000XL 1.0Gb	£15	£73
SONY QW3010XLF 850Mb	£16	£78
SONY QW3020XLF 1.7Gb	£18	£87
SONY QW3080XLF 4.0Gb	£19	£92

DDS TAPES

Digital Data Storage	1's	5's
3M D4/120M 4mm DDS2	£8.00	£39
3M D4/90M 4mm DDS1	£3.25	£15
3M D4/60M 4mm DDS1	£3.95	£19
3M D8/112M 8mm	£3.50	£17

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10 x 4mm/90m for £27.50

SONY DG4/90M DDS1 (2Gb)	£3	£14
SONY DG4/120M DDS2 (4Gb)	£7	£34
HP 125M 4mm DDS3 (12Gb)	£21	£99
HP 120M 4mm DDS2 (92300A)	£11	£50
HP 4mm CleaningTape (92283K) (2's)		£15
Digital Compac IV (20/40Gb)(TK88)	£60	£290

HIGH CAP MEDIA

3M Data Cartridges	1's	5's
3M DC 2120Xi (QIC-80 Formatted)	£6	£29
3M DC 2120XLxi (Formatted)	£10	£48
3M MC 3000XL PIMAT (700Mb)	£17	£83
3M MC 3000XL TAUMAT (1400Mb)	£18	£87
IOMEGA Ditto 2Gb	£13	£64
3M DC 6150 150Mb	£10	£48
3M DC 6250 250Mb	£11	£53
3M DC 6525 525Mb	£15	£73

		PACK	PRICE
SuperDisk	LS120	3 PK	£23
SuperDisk	LS120	5 PK	£38
SuperDisk	LS120	10 PK	£66

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iOMEGA	ZIP 100MB	EACH	£9
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PRICE EACH		1-4	5+
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SONY	£11.00	£10.50	£10.0

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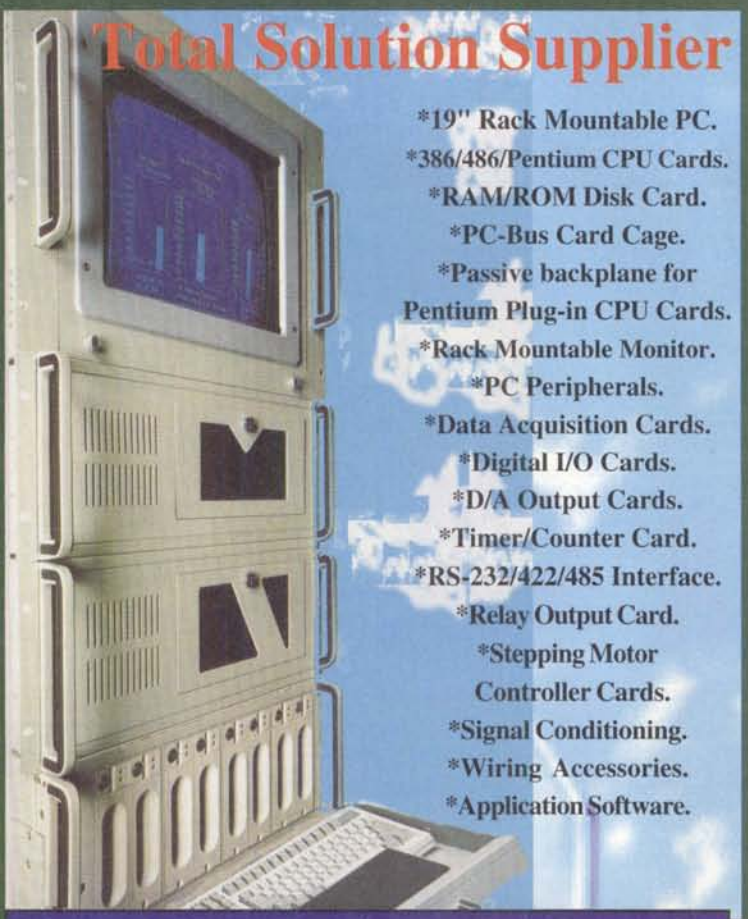

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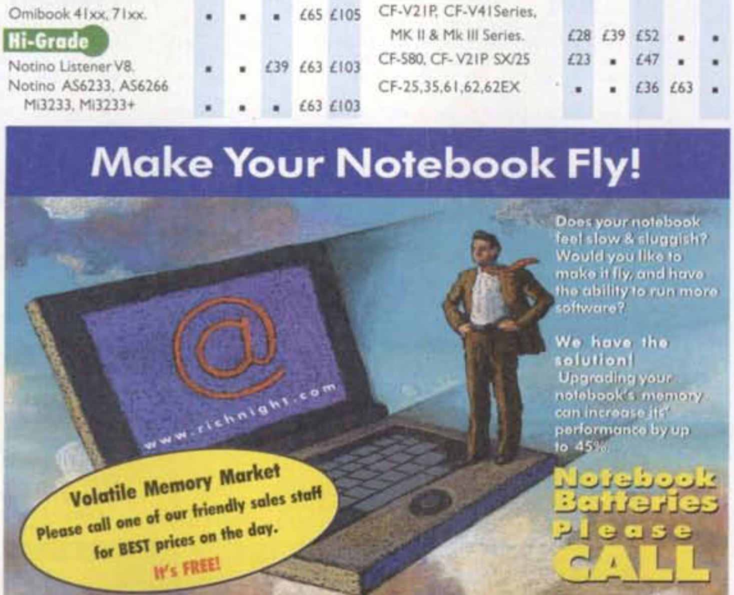

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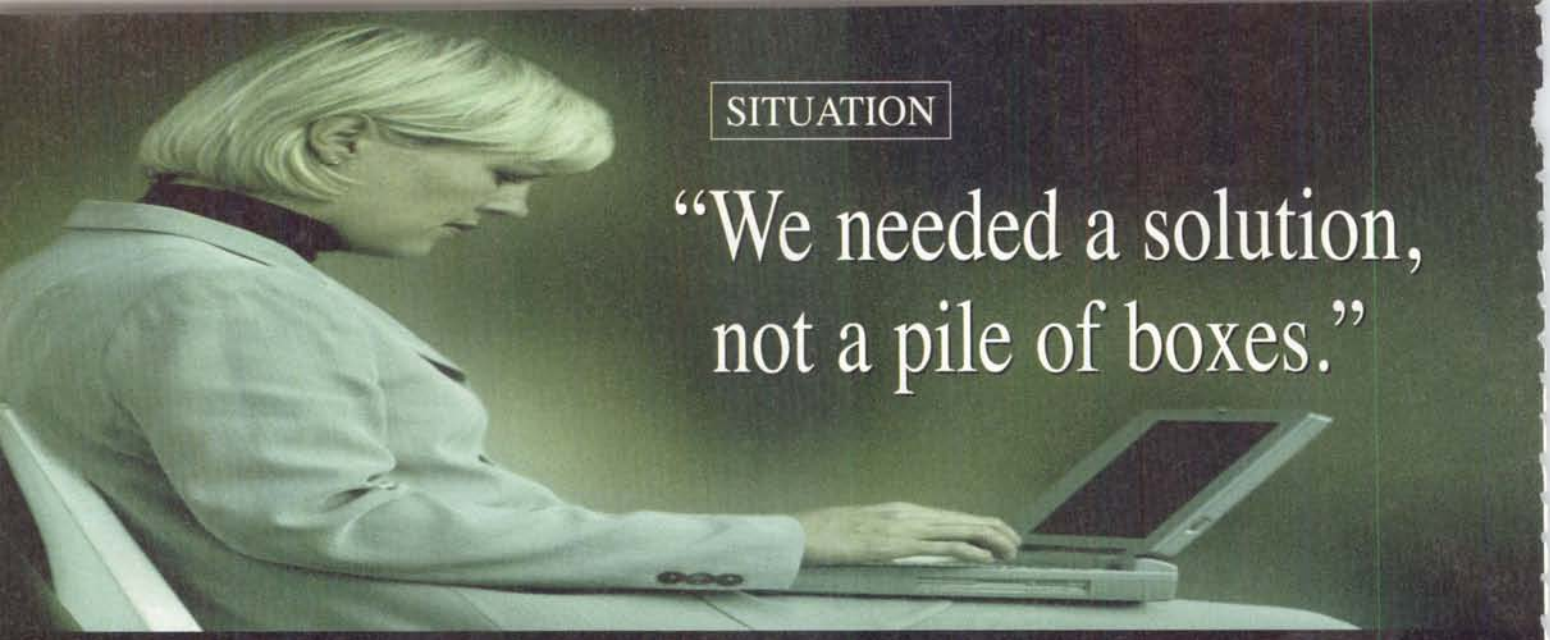

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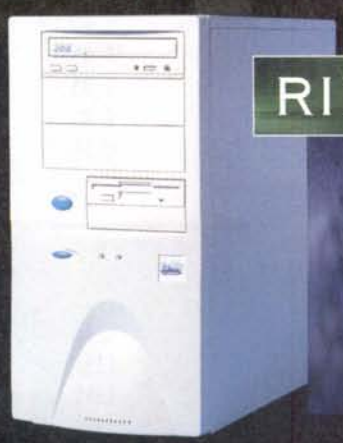

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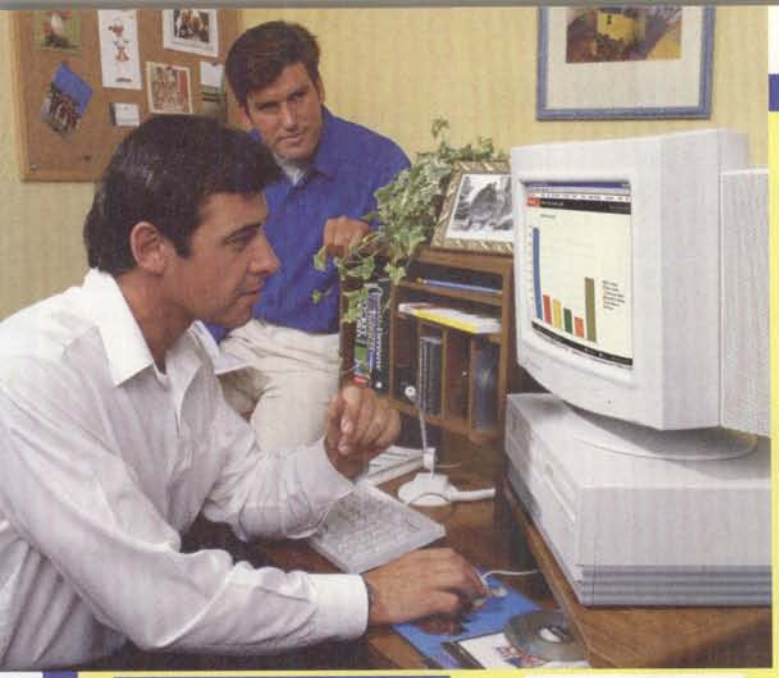

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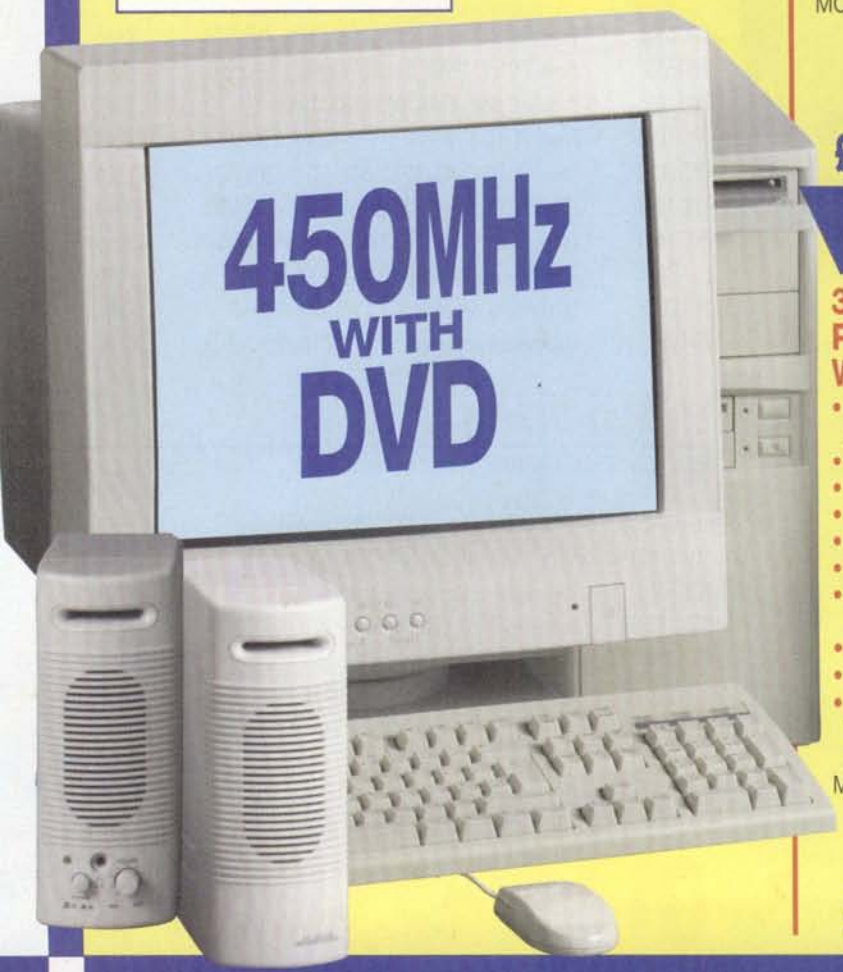

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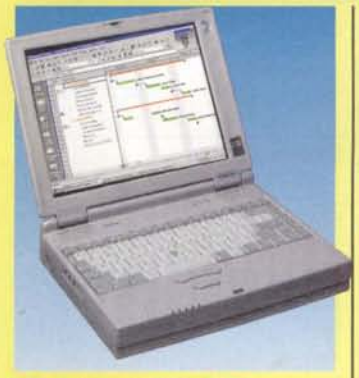

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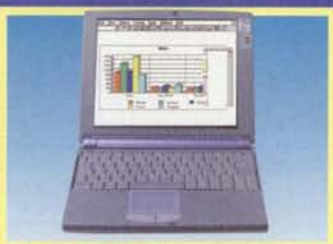

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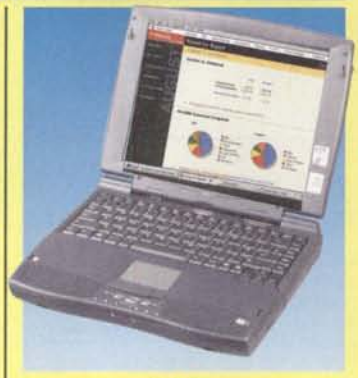

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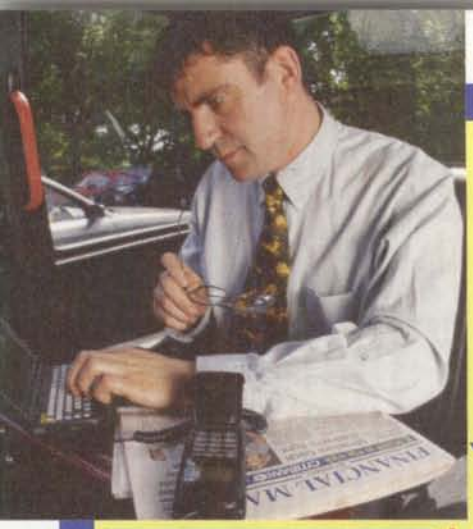

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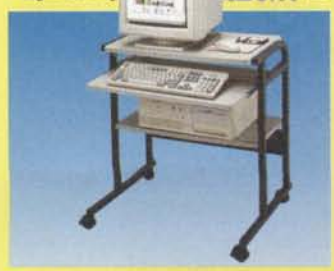

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Others make you return your PC to the store for reconfiguration and charge you extra for it.

* Not available with Home Starter System

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intel inside celeron™ PROCESSOR

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Includes printer

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PICO 33.6K Fax/Data modem	£79
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PICO 10MbpsEthernet combo card	£49
PICO 100Mbps Ethernet card	£69
PICO ISDN card	£149
PICO 56K Fax/Data modem & ISDN	£299
PICO Ethernet/56K Fax/Data modem	£229

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MODEL	PRICE
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PSION Series 5 8MB with PsiWin (not CE)	£309
PSION Series 3MX	£215
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AA World Travel Companion Everything about the world's 22 most visited cities	£24
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On Schedule for Windows CE Contact and information manager	£39
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GSM ONLY	£119
FirstFone	£299

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MODEL	PRICE
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12MB Compact Flash	£52
16MB Compact Flash	£62
32MB Compact Flash	£99
48MB Compact Flash	£139
Card Reader	£79

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PC CARDS

MODEL	PRICE
Argosy CD-ROM 8 Speed	£79
10 Speed	£99
Game Card Joystick	£45
Actiontec SCSI	£89
Option 56.6 Fax/Data modem	£139
Socket Serial Card	£129
Greycell V.34 + Ethernet	£159
IBM 3270 Card	£195

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CTX

BEST VALUE ULTRA PORTABLE

The 5 data & video projectors in the CTX range only weigh 4.5Kg to 5.4Kg offering the simplest solution for the travelling executive and mobile presenter. They project at a brightness of 350-550 ANSI lumens for 'Lights On' presentations producing a 2 metre image at 2 metres distance. CTX EzShow projectors provide great resolutions & high definition images. The units will arrive 'ready-to-go' with hard carry case and a fully featured remote control.

MODEL				PRICE
CTX 500	(VGA)	350ANSI	4.5Kg	£995
CTX 550	(SVGA)	350ANSI	4.5Kg	£1350
CTX 500M	(SVGA)	350ANSI	4.5Kg	£1600
CTX 600	(SVGA)	550ANSI	5.4Kg	£2295
CTX 680	(XGA)	550ANSI	5.4Kg	£3285

EPSON

EPSON QUALITY

Epson offer a complete range of quality projectors - the new EMP5100 has an amazing brightness of 750 ANSI Lumens and can compress to 1024x768. The EMP7100 has true 1024 x 768 resolution providing high quality images at 650 ANSI lumens.

MODEL				PRICE
EMP 5100	(SVGA)	750ANSI	5Kg	£3385
EMP 7100	(XGA)	650ANSI	5Kg	£4195
EMP 7300	(XGA)	1200ANSI	5Kg	£6995

ASK

NEW STAR BUY 3.5Kg

The A4 Compact is the ultimate in portable solutions. This projector weighs only 3.5kg. 650 ANSI lumens give excellent picture quality even in brightly lit rooms. Digital zoom controls, split screen and PC mouse control makes this by far this months 'STAR BUY'

MODEL				PRICE
ASK A4	COMPACT(SVGA)	650ANSI	3.5Kg	£3550
ASK A4+	(SVGA)	750ANSI	5Kg	£3295
ASK A6+	(XGA)	650ANSI	5Kg	£4295
ASK A10	(XGA)	1200ANSI	5Kg	£6800

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From as little as £75 per day

Up to 1 week of hire charges fully refundable against any projector purchase- The ultimate in try before you buy

HITACHI

ULTRA PORABLE

The CP-S830 (800 x 600res.) portable projector does not sacrifice the features necessary for use in wide ranging presentation situations. This projector will astound and add to every corporate training session or presentation

MODEL				PRICE
CPL 850	(SVGA)	650ANSI	7.5Kg	£2450
CPL 950	(XGA)	650ANSI	7.5Kg	£3375
CPL 830	(SVGA)	500ANSI	5Kg	£2245

PANASONIC

BEST VALUE DESKTOP

True SVGA/XGA quality projection. 650ANSI lumens with digital zoom and new lens shift capability. This projector offers vivid reproduction of all your computer and video graphics

MODEL					PRICE
L595	(SVGA)	700ANSI	8.5Kg	NEW	£2600
L795	(XGA)	650ANSI	8.5Kg	NEW	£3700

INFOCUS

EDITOR'S CHOICE

The Infocus 725 is very portable at only 5kg. It has all the features for the future with 750 ANSI Lumens and true 800x600 resolution and the facility to compress to 1024x768 resolution. July 97 Editor's Choice PC Magazine.

MODEL				PRICE
INFOCUS 725	(SVGA)	750ANSI	5Kg	£3475
INFOCUS 735	(XGA)	650ANSI	5Kg	£4545
INFOCUS 425	(SVGA)	500ANSI	3.1Kg	£3195

NEC

200:1 Contrast Ratio

The NEC MT820 and MT1020 LCD projectors provide highly portable display solutions, sophisticated images and customizeable controls, with high brightness.

MODEL				PRICE
MT 820	(SVGA)	750ANSI	7Kg	£2995
MT 1020	(XGA)	650ANSI	7Kg	£3995
LT80	(SVGA)	600ANSI	4.5Kg	£2995

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- Intel Tillamook TCP 200Mhz /266Mhz with MMX
- 2.5" 2.1Gb Hard Disk
- 32Mb SDRAM/64Mb Optional
- 10.4" TFT (800x600) screen
- Carry case & world-wide mains battery charger
- 512k cache & 2Mb Graphics card
- 1 USB Port & optional CD-ROM (£109.00)

MODEL	PROCESSOR	PRICE
980-233	INTEL P-233	£899
980-266	INTEL P-266	£999

SHARP HC4000 & HC-4500A
with windows CE (V.2)

Sharp's unique image editor allows you to draw and edit image files as well as capture images from the internet or with the optional digital camera card.

- 7 one-touch application keys
- 640x240 touch screen LCD
- Colour VGA screen
- Image editor. Create/edit images.
- Voice recorder
- Multimedia E-mail
- Seamless connectivity
- PC Card slot Type II
- CE Windows Version 2
- Optional docking station

MODEL	PRICE
HC-4500A Colour Screen	£449
HC-4000A Mono Screen	£189
Digital Camera	£275

HP COLOUR 620LX
with windows CE (V.2)

Built on the features of the HP 360LX . A bright, 256-colour display delivers unmatched readability. The optional VGA-out PC card lets you give full colour PowerPoint presentations using any standard VGA monitor or projector. With instant voice recording you can document ideas. Complete with Word, Excel and other CE applications.

- 640x240 LCD, 256 colour Backlit, Auto dimming
- 16MB RAM, 75Mhz CPU
- 1 x PC Card Type II, Compact Flash
- Dimensions 7.8 x 4.1 x 1.4"
- Lithium-ion rechargeable battery pack
- 1 x RS232C, 1 x IrDA. Includes
- Word, PowerPoint, Excel, Internet Explorer, FAX Pro

MODEL	PRICE
620LX	£479
360LX	£339

Optional VGA Card £89 • Compact Flash PC Card Reader £79 • Leather Case £49 • 3 Year Warranty £66 • Chess £49

COMPAQ C-SERIES
with windows CE (V.2)

- C-Series 810; 8MB, 16MB ROM, 33.6Kbps soft modem, 640x240 resolution mono display, AC Adaptor
- C-Series 810C; Same as 810 but with 256 colour full time back light display rechargeable NiMH battery
- C-Series 2010C; Same as 810C But with 20MB RAM and conveinience cradle and desk stylus bundle in.
- Integrated 33.6Kbps modem
- Type II PC Card slot
- Voice memo recording/ playback
- Integrated flash memory, Pocket Asset manager, Encrypted password and great software bundle

MODEL	PRICE
810	£359
810C	£429
2010C	£489

4 MB memory expansion £24 • 16Mb memory expansion £75
Ask for ATA Flash Prices

CASSIOPEIA E-10

The Cassiopeia enables you to carry all your Personal Information Management (PIM) data; contact, schedules, and tasks wherever you are. The ActiveSync technology will automatically update the information when connected to your desktop PC. The E-10 allows you to stay in touch away from your desktop PC through both sending and receiving e-mail messages.

- MS Windows CE V.2.1
- Monochrome FSTN sceen
- EL backlit screen
- 4MB RAM
- RS232C serial port
- Optional Compact Flash card
- Weight: 156g
- E-mail, voice recorder, contacts, tasks and schedules

MODEL	PRICE
CASSIOPEIA	£219

3COM PALM PILOT (not CE)

Stores thousands of addresses, phone and fax numbers, hundreds of To-Do lists and personal notes and dozens of e-mail messages. The backlit screen lets you see it all easily.

- Seamless synchronisation with a desktop
- Find information instantly
- Long battery life
- Intuitive easy-to-use interface with accurate pen recognition
- Optional SnapOn GSM adaptor enables you to update your schedule, access your e-mail and synchronise all your data wherever you are

MODEL	PRICE
Professional	£159
Personal	£109
PalmPilotIII	£229
IBM WorkPad with Lotus Notes	£234

Slim Leather Case £17 • Delux Leather Case £49 • GSM Modem £99 PSTN Modem £79

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- Lifetime telephone support
- Inclusive 3 year support plan
  - -1st year full parts and labour
  - -2nd and 3rd year labour free
- Optional 2nd & 3rd year full parts and labour
  - -Insurance backed cover arranged in association with CPU Finance Ltd.
  - -£70/year
- Diamond 12 monthe ON SITE warranty
  - -Engineer callout within 48 hours
  - -2nd year Diamond Warranty. On-site call out with parts and labour £110
  - -3rd year On Site £110

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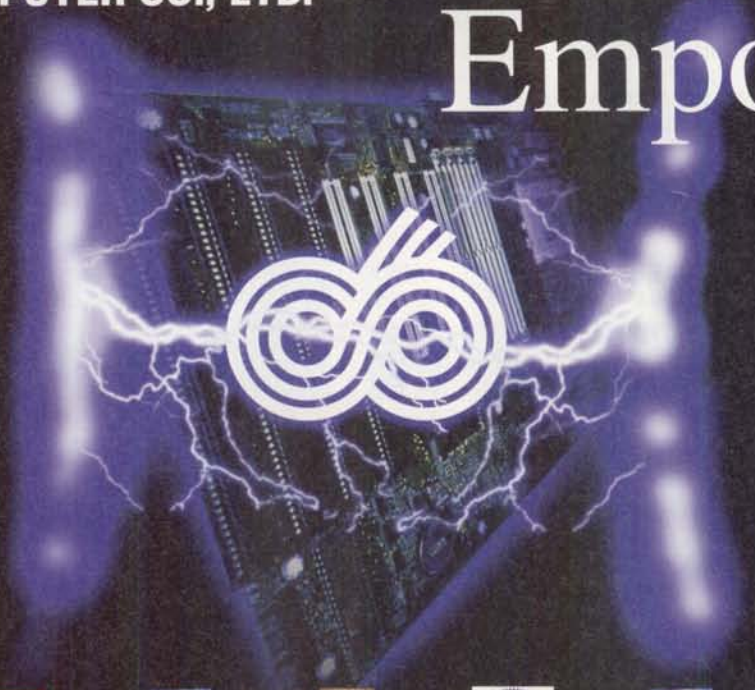

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August 1998	December 1997*	December 1997	June 1998	March 1998*	August 1997	March 1998	October 1997

* Awards won in conjunction with EveshamVale PC's.

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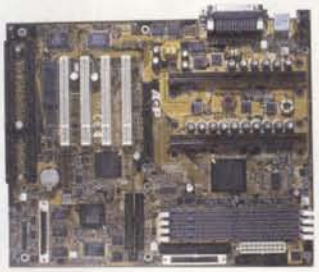
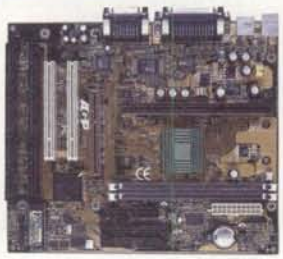
- Intel 440BX Chipset
- Supports up to Dual 450MHz Intel Pentium II
- Ultra2 SCSI with RAIDport III on-board
- AGP slot
- *SeePU* jumperless CPU setting
- Supports SDRAM up to 512MB
- Two USB ports on board
- 66/100MHz system clock speeds
- Supports 68/75/83/103/112MHz system clock speeds for CPU over-clocking possibility
- Supports SB-Link header for Creative PCI audio



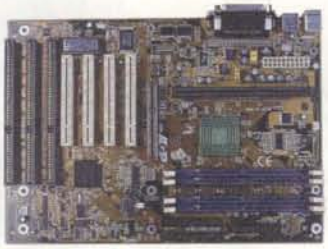
CT-6ESA

- Intel 440EX Chipset
- Supports up to 333MHz Intel P-II or Celeron
- AGP slot
- *SeePU* jumperless CPU setting
- Supports SDRAM up to 256MB
- Two USB ports on board
- Supports 68/75/83MHz system clock speeds for CPU over-clocking possibility
- On-board PCI stereo audio controller



CT-6BTM

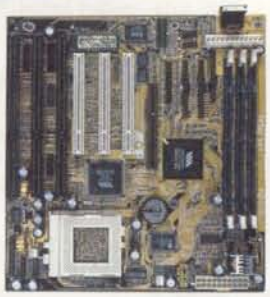
- Intel 440BX Chipset
- Supports up to 450MHz Intel Pentium II
- Also supports Intel Celeron 333MHz
- AGP slot
- *SeePU* jumperless CPU setting
- Supports SDRAM up to 512MB
- Two USB ports on board
- 66/100MHz system clock speeds
- Supports 68/75/83/103/112MHz system clock speeds for CPU over-clocking possibility
- Supports SB-Link header for Creative PCI audio



CT-5AGM2

- Via MVP3 chipset
- Baby AT form factor
- Supports Intel MMX 233MHz
- Supports Cyrix/IBM upto 333MHz M-II CPU
- Supports IDT CPU Winchip2
- Supports AMD CPU upto K6-2 350MHz
- AGP Slot
- Supports SDRAM up to 384MB
- Dual Channel USB Header
- Supports 68/75/83/95/100 Mhz system clock speeds

Supports AMD K6-2 3DNow!



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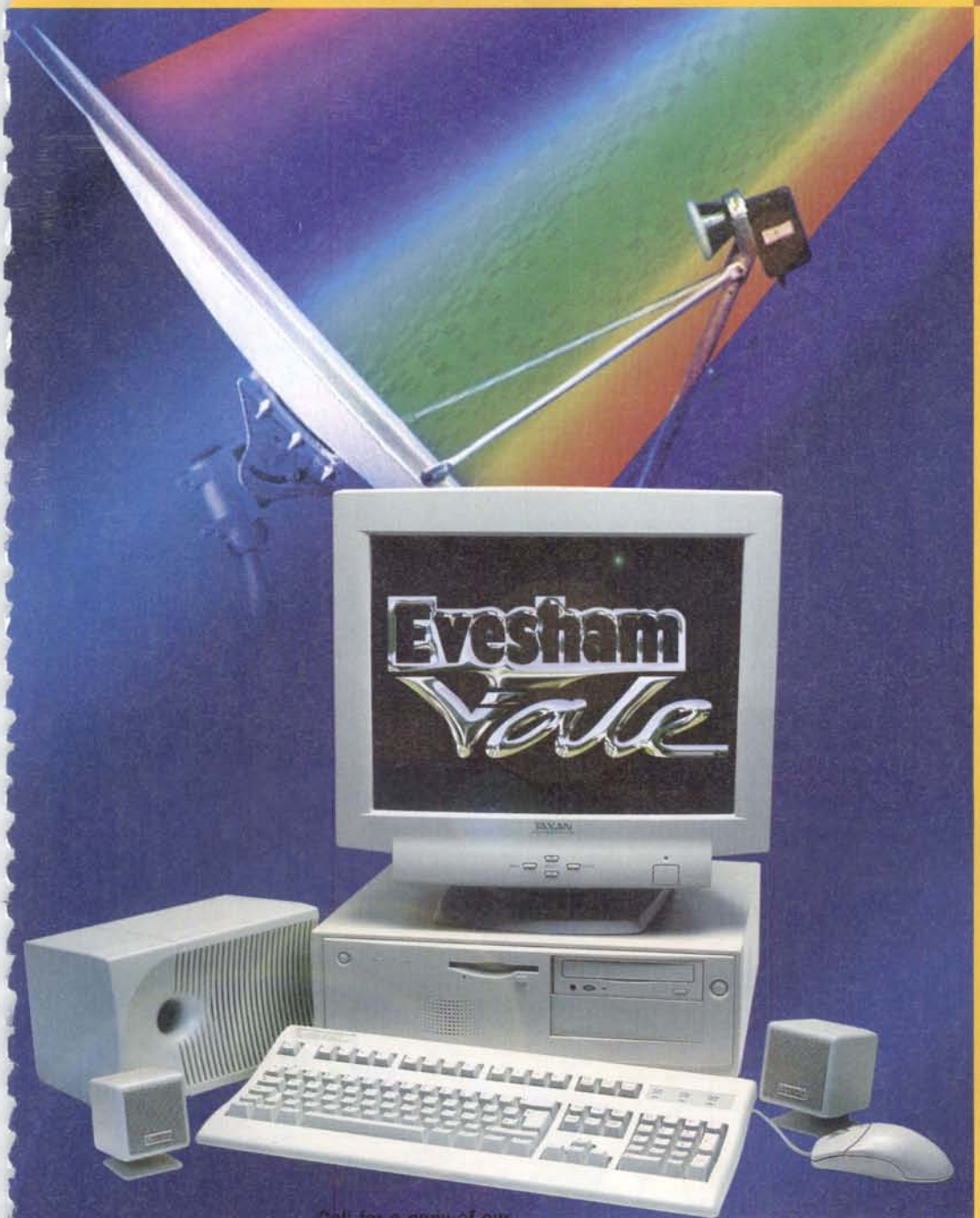

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3 year on-site maintenance parts & labour

0800 Technical Support

Above: Our technical support department which now numbers over 30 strong.

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Left: *Vanessa Fairs, Evesham Telesales.*

Right: *Our spacious new showroom, in* ***Vale Park****, Evesham*

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b) Start a 3 year repayment plan with 36 equal monthly payments – APR 24.9% (and you still pay no interest on the first 6 months).

No deposit personal finance.
Flexible credit agreement to spread payment over 12, 24 or 36 months. No deposit. APR 16.7%

Example

If you purchase a system for £1000 and, after 6 months, enter the 3 year repayment plan, you would pay 36 monthly payments of £38.46. Total amount payable would be £1384.56.
(Example does not include delivery or payment protection)

Please note that actual products (including screen displays) may not exactly match the photographic representations. On-site warranty applies to UK mainland only. Industry standard practice is to quote a monitor's CRT size – the actual viewing area is approximately 1" less. Hard disk capacities are quoted in thousands of millions of bytes (as is industry standard practice). Bundled versions of video cards, sound cards and software are not full retail packs, and the software features on-line documentation. Occasionally we may supply vouchers for software titles which need to be redeemed with the manufacturers. Note that we are unable to offer a 14 day moneyback guarantee on any software, or on any special order item which is not featured in the advertisement. The Intel Inside logo, Pentium Processor logo, Pentium, MMX, and Celeron are trademarks of Intel Corporation. Microsoft is a registered trademark and the Office logo is a trademark of Microsoft Corporation. All other trademarks acknowledged. All orders are subject to Evesham Micros' standard Terms and Conditions of trading – these are available on request. E&OE.

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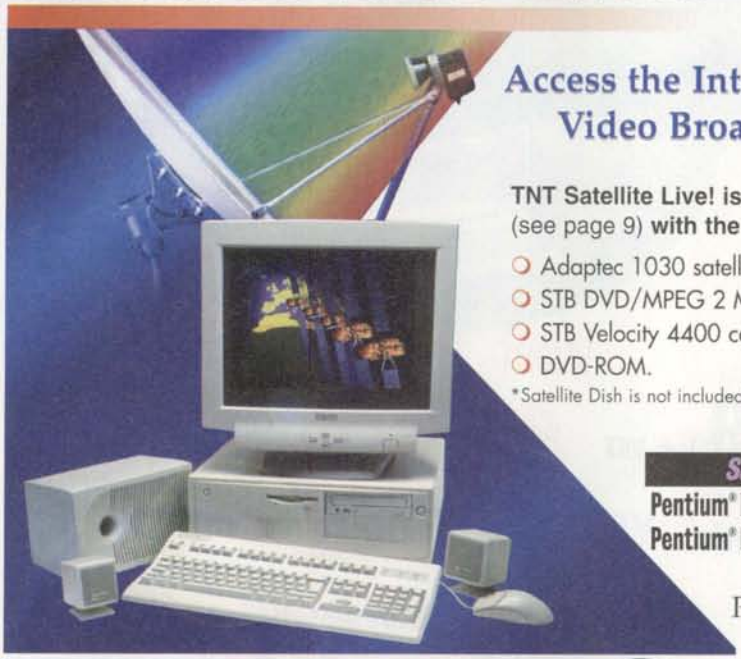
New Technology

Satellite TNT Live!

Now Open On Sunday
10:00am - 16:00pm



Access the Internet at 256k and receive Digital Video Broadcast via Eutelsat live on PC.

TNT Satellite Live! is based on our Platinum TNT Live! model (see page 9) **with the following enhancements:**

- Adaptec 1030 satellite receiver card.
- STB DVD/MPEG 2 Movie Theatre playback card.
- STB Velocity 4400 card specially designed for satellite.
- DVD-ROM.

*Satellite Dish is not included as standard.

Satellite TNT Live!	
Pentium® II 400	£1699 +VAT (£1996.33)
Pentium® II 450	£1839 +VAT (£2160.83)

Please call and ask for technical data sheet SAT2000 for full information & FAQs

"It will blow your home theatre away!"

The latest audio technology

SoundBlaster Live! introduces a new dimension of audio by including features and performance surpassing professional Hollywood-quality audio equipment.
With an amazing 256 voices of music synthesis and real-time audio enhancement, enjoy live concert-like music productions so dynamic you'll feel right in the middle of an orchestra. The SoundBlaster Live! hardware-accelerated Environmental Audio Extensions™ (EAX™) support new titles and offer an experience that goes way beyond 3D audio.

Environmental Audio™ by CREATIVE

PCAnswers verdict

- Knockout surround sound
- Powerful sound processor
- Open and excellent EAX standard
- Not quite Digital Dolby standard

Overall 91%

"We have no hesitation in declaring the SoundBlaster Live! to be the most significant advance in PC audio since the development of the soundcard itself"
9/10 PC Review

"The SB Live! will do for sound, what Voodoo did for graphics"
95% PC Format

For PCs featuring the SoundBlaster Live! value see our **GameStation III** model on page 4 and **Platinum TNT Live!** range on page 9.

The latest graphics technology

STB VELOCITY 4400

The new VELOCITY 4400 delivers next generation 3D graphics performance that simply blows away everything that has come before. Its NVIDIA RIVA TNT graphics engine is the first integrated 128-bit 3D processor capable of processing two pixels per-clock-cycle. This technique enables the application of multi-textures in a single pass for incredible realism and phenomenal frame-rates.
VELOCITY 4400 also features 16MB of high-speed video memory and a powerful 250MHz RAMDAC. This potent combination ensures that it won't be left standing when it comes to 2D performance.

For PCs featuring the Velocity 4400, see our **Prestige TNT** range on page 7 and **Platinum TNT Live!** range on page 9.

PCAnswers verdict

- The fastest 2D/3D around
- Two texture units
- Great value

Overall 91%

www.gamespot.com
Rating: ★★★★★

"...beats any 2D/3D combo card hands down"

Evesham Value

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Web: http://www.evesham.com

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Fax: 0121 683 6869	Fax: 01223 322 883	Fax: 01908 230 865	Fax: 0113 203 2001	Fax: 00 353 1 855 4440

ENTHUSIAST'S EDITIONS

BUY NOW PAY 1999
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GameStation III

The new 3Dfx Voodoo 2 chip has taken 3D gaming performance into to a new dimension. The GameStation III combines the power of the 12Mb Creative Labs Voodoo 2 3Dfx card with a 350Mhz Intel Pentium II processor and 64Mb of RAM for maximum speed. Big performance is coupled with a big monitor, a 17" model, and big sound from the incredible FourPointSurround system which comes with a sub-woofer. If you want the best in 3D performance this system offers incredible value for money!!

GameStation III in the desktop case (Mid-Tower case is a no cost option)

GameStation III:
Prestige Pentium II 350 MULTIMEDIA PC
with the following upgrades:

- 10Gb hard disk
- Creative Labs 12Mb Voodoo 2 3Dfx card
- Creative Labs SoundBlaster Live! value sound card
- 17" EveshamVale monitor
- Diamond PCI v.90 56k voice capable modem
- Truly Internet ready (see page 5 for details)
- DVD-ROM drive (also works as CD-ROM drive)
- Creative Labs FourPointSurround speaker system
- Suncom F15-E Talon joystick

See page 6 for full details of Prestige models

BT Click
for direct internet access

only (£1148.09+VAT)
£1349 inc VAT

Want the PC with the best game-playing performance?

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

canopus CREATIVE CREATIVE LABS Panasonic YAMAHA Quantum CAPACITY FOR THE EXTRAORDINARY™ adaptec

MovieStation

The best DV capture card in the world is now available in PAL format, enabling us to offer this professional video editing suite...

MovieStation 98

- 400MHz Intel Pentium® II processor
- Dual processor capable motherboard with Intel 440BX AGPset
- 128Mb SDRAM (100MHz)
- 2x 9Gb Quantum Viking II LVD SCSI super fast hard disks
- Adaptec 2940 LVD U2W SCSI controller
- 8Mb ATI Xpert98 AGP 3D graphics accelerator and ATI 8Mb Xpert@Work PCI graphics accelerator
- 19" Taxan Ergovision 975 TCO95 monitor and 15" Ergovision 550 TCO95 monitor
- Canopus DVRex-M1 digital audio and video capture with Ulead MediaStudio Pro 5.02 – the ultimate video editing solution now with audio scrubbing
- DVD-ROM drive (also works as CD-ROM drive) – or upgrade to DVD-RAM
- SoundBlaster PCI 64 wavetable sound card
- Yamaha YST-MS25 speaker system with sub-woofer
- High quality 'wheel' mouse
- Windows 98

MovieStation 98

MovieStation 98
£4249 +VAT (£4992.58)

MovieStation NT:

- 8Mb ATI Xpert 98 AGP 3D graphics
- 21" Taxan Ergovision 2160 TCO95 DiamondTron monitor
- Windows NT

Other specifications as MovieStation 98

£4449 +VAT (£5227.58)

MovieStation EL:

- Single processor capable motherboard
- 10.2Gb Quantum Fireball EL IDE hard disk
- 8Mb ATI Xpert 98 AGP 3D graphics
- 19" Taxan Ergovision 975 TCO95 monitor

Other specifications as MovieStation 98

£3249 +VAT (£3817.58)

canopus DVRex-M1

NEW REX EDIT V2 SOFTWARE

The complete DV editing system

- Internal (drive bay) or external breakout box
- Two Firewire IEEE1394 ports, composite and S-video in and out, component video out
- Optimised Sony DVBK-1 hardware DV CODEC, no loss of quality
- Convert existing analogue video to DV
- High quality, real-time, full-screen preview and to external video monitor
- DV batch capture. Capture up to 20 minutes in one .AVI file – seamlessly capture longer clips to multiple files
- Hardware shuttle and jog with wheel mouse, real-time audio and video scrubbing
- Rex Edit Version 2: now with full range of editing transitions and WYSIWYG titles. Also rendering speed like you wouldn't believe - 1 sec dissolve in about 3 seconds
- Digital audio in/out (coaxial and optical) with DVRex-M2 option

DV LIVE "this is a professional system that will find happy use in day-to-day editing situations."

DV REX-M1 ONLY
£1899 +VAT (£2231.53)

newmedia.com "Canopus has made the most of its hardware with support for native DV audio, simultaneous previews on the computer screen and video monitor, and the best software integration currently on the PC."

Speed
Performance
Connectivity
True Multitasking
SCSI
adaptec

MovieStation Upgrades

DV-REX M2 option board	£300+VAT (£352.50)
Upgrade to 256Mb RAM	£160+VAT (£188.00)
32x CD-ROM drive instead of DVD RAM drive	deduct £40+VAT (£47.00)
DVD-RAM drive instead of DVD-ROM	£280+VAT (£329.00)
HP Surestore CD-RW 8100	£259+VAT (£304.33)
Canon XL1 DV camcorder	£2720+VAT (£3196.00)

DV ratings

Performance	5
Features	5
Ease of use	4
Value for money	4
Overall rating	90%

"Video capture was rock solid from either analogue or fire-wire sources, and device controlled batch capture was seamless. Similarly, playback off the Media Studio timeline was smooth. Overlay exhibited none of the problems you occasionally find."

Computer RECOMMENDER

"...this Evesham DV Rex-M1 package gives you a complete editing solution that works extremely well."
James Morris - Computer VIDEO

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EveshamVale

EveshamVale

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10:00am - 16:00pm

Prima

We have set out to build a quality PC and sell it at a keen price, whilst still offering a standard of equipment that allows us to maintain our award winning level of service and support. The Prima is the result and is now established as a standard setting entry level PC, as confirmed by winning Computer Shopper's "Best Buy" award when pitted against computers from 13 leading suppliers.

From £399 +VAT (£468.83)

Prima Standard models:

- 512kb cache *(WinChip models)*
- 128kb processor speed cache *(Celeron models)*
- Intel Slot One *(Celeron models)* for processor upgrades
- Socket 7 *(WinChip models)* for processor upgrades
- 16Mb RAM *(WinChip 200 models)*
- 32Mb RAM *(other models)*
- 2.1Gb hard disk *(WinChip 200 models)*
- 4Gb hard disk *(other models)*
- ATI 2Mb PCI video card
- 14" SVGA monitor
- 14 day moneyback guarantee
- 1 year on-site maintenance for parts and labour
- Lifetime technical support hotline
- Year 2000 ready BIOS
- 1 EPP parallel port and 2 serial ports with 16550 UART
- 3.5" 1.44Mb floppy disk drive
- Mini-tower case
- TÜV approved power supply with low noise fan
- 'Windows95' keyboard
- Mouse
- Windows98 installed, with full manuals and disks supplied (Windows95 is a no cost option)

Prima MULTIMEDIA models and Media98 models also have: (In addition to Standard)

- 32x CD-ROM drive
- SoundBlaster 16 compatible sound
- Amplified speakers

Prima Multimedia PC (case style may vary)

EveshamVale Prima

Processor:	Standard	MULTIMEDIA	Media98
idt WinChip™ 200 MMX, 16Mb RAM, 2.1Gb HDD	£399 +VAT (£468.83)	£469 +VAT (£551.08)	£539 +VAT (£633.33)
idt WinChip™ PR233 MMX, 32Mb RAM, 4Gb HDD	£449 +VAT (£527.58)	£519 +VAT (£609.83)	£609 +VAT (£715.58)
Intel Celeron™ 333, 32Mb RAM, 4Gb HDD	£499 +VAT (£586.33)	£539 +VAT (£633.33)	£629 +VAT (£739.08)

Reviews

COMPUTER SHOPPER
"Good specification, good performance and a good price."
EveshamVale Prima

PC Plus
"the main components for which you're likely to buy are all sound and well coupled together. A good, base level PC."
EveshamVale Prima

BEST BUY COMPUTER SHOPPER LABS
"If we were choosing the machine that combined performance, presentation and configuration then our choice would be narrowed down to the Evesham. ...we fully approve of its documentation, setup and choice of components"
EveshamVale Prima

Prima upgrades

16Mb to 32Mb RAM	£40+VAT (£47.00)
32Mb to 64Mb RAM	£40+VAT (£47.00)
15" EveshamVale monitor	£30+VAT (£35.25)
17" EveshamVale monitor	£115.11+VAT (£135.25)
Diamond PCI v.90 56k voice capable modem	£49+VAT (£57.58)
Desktop case *(illustrated page 8)*	£25+VAT (£29.38)
Second year on-site maintenance	£40+VAT (£47.00)
ValeStart Service	£60+VAT (£70.50)

Media98

10 of Microsoft's latest and most popular software titles:

- Microsoft Works – The world's most popular integrated word processor, spreadsheet, database, drawing and communications package.
- Microsoft Encarta 98 – Award winning multimedia encyclopaedia (International Edition)
- Microsoft Encarta 98 World Atlas – The world's leading atlas
- Microsoft Magic School Bus Rainforest – A fun filled, fact pact science adventure in the Costa Rican rainforest.
- Microsoft Monster Truck Madness 2 – Down and dirty racing.
- Microsoft Money 98 – The easy way to manage your finances.
- Microsoft Golf 98 – The top selling golf game for Windows.
- Microsoft Football – Experience all the atmosphere of world class football.
- CART Precision Racing – All the speed and thrills of Indy car racing with this simulator.
- Chaos Island: Jurassic Park – Real-time kids strategy game based on the hit film.
- Suncom Joystick

This bundle is included with all EveshamVale Media98 PCs – see the following pages

Software boxes shown for illustration only. Please note that the software is not supplied in retail packaging.

'Access the Internet with a single click!

Connecting to the Internet is as simple as plugging your PC into a phone line and clicking on the BT Click icon on the desktop. BT Click is a brand new pay as you go service, offering you the freedom and flexibility to access the Internet without subscription fees or commitments - you simply pay for your on-line time.

BT Click

- No registration process
- No subscription charge
- No connection charge
- No contract
- No commitment - just pay for your time on-line!

And that's it! The only cost is the call charge (local rate plus 1p per minute) which is added automatically to your phone bill.

Do you need a little help installing your new computer?

For just £60+VAT one of our ValeStart technicians will come to your home and ensure that your computer is properly installed and configured and then demonstrate to you how to use the PC to its full potential.

Once the engineer has left, you're not on your own – Evesham Micros give you the reassurance of a dedicated, knowledgeable and friendly technical support line, for the lifetime of your PC. The technicians are there to answer your questions, give you advice or point you in the right direction should you take a wrong turn. And what's more, calls to the Technical support line are free.

Unlike most suppliers we include on-site maintenance as standard. If something goes wrong we will send one of our engineers to your home to sort out the problem. Let's face it, the last thing you will want to do if your computer breaks down is to have to pack it all up and return it to a supplier for an unknown length of time!

BIRMINGHAM 0121 683 6868 Fax: 0121 683 6869
CAMBRIDGE 01223 323 898 Fax: 01223 322 883
MILTON KEYNES 01908 230 898 Fax: 01908 230 865
LEEDS 0113 203 2000 Fax: 0113 203 2001
DUBLIN 00 353 1 855 4444 Fax: 00 353 1 855 4440

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Prestige

See page 4 for ENTHUSIAST'S EDITIONS

Our benchmark PC – available in a range of configurations to suit most applications.

Prestige Standard models:
- Intel 440EX AGPset *(Celeron models)*
- Intel 440BX AGPset *(Pentium II models)*
- 128kb processor speed cache *(Celeron models)*
- 512kb cache *(Pentium II models)*
- 64Mb SDRAM
- 4Gb hard disk *(Celeron models)*
- 6.4Gb hard disk *(Pentium II models)*
- ATI 4Mb 3D Charger AGP video card
- 15" EveshamVale monitor *(Celeron models)*
- 17" EveshamVale monitor *(Pentium II models)*
- 2x Universal Serial Bus (USB) ports
- 14 day moneyback guarantee
- 2 years on-site maintenance for parts and labour
- Lifetime technical support hotline
- Year 2000 ready BIOS
- 1 EPP parallel port and 2 serial ports with 16550 UART
- 3.5" 1.44Mb floppy disk drive
- Choice of desktop or midi-tower case
- TÜV approved power supply with low noise fan
- 'Windows95' keyboard & mouse
- Windows98 installed, with full manuals and disks supplied (Windows95 is a no cost option)

Prestige Multimedia PC with 17" EveshamVale monitor (PC case sytle may vary)

Prestige MULTIMEDIA, Media98 and Office models also have the following hardware: (in addition to Standard)
- 32x CD-ROM drive
- SoundBlaster 16 compatible sound *(Celeron models)*
- SoundBlaster PCI 64 wavetable sound *(Pentium II models)*
- Amplified speakers

Now Open On Sunday
10:00am - 16:00pm

See p5 for details of Media98 software.

Microsoft Office97
See p7 for details of the Microsoft SBE software pack

Create your own CDs!
- Easily create data, audio and multimedia CDs on your PC.
- Send video postcards on CD that automatically play on any PC.
- Back up important files such as tax records, spreadsheets and financial data.

Panasonic CW7582 recordable CD drive ..... £150+VAT (£176.25)
Adaptec Easy CD Creator software ..... £15+VAT (£17.63)

EveshamVale Prestige: 64Mb RAM, 4Gb HDD

Processor:	Standard	MULTIMEDIA	Media98	Office
Intel Celeron™ 333	£579+VAT (£680.33)	£619+VAT (£727.33)	£709+VAT (£833.08)	£749+VAT (£880.08)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

EveshamVale Prestige: 64Mb RAM, 6.4Gb HDD

Processor:	Standard	MULTIMEDIA	Media98	Office
Intel Pentium® II 350	£749+VAT (£880.08)	£789+VAT (£927.08)	£879+VAT (£1032.83)	£919+VAT (£1079.83)
Intel Pentium® II 400	£869+VAT (£1021.08)	£909+VAT (£1068.08)	£999+VAT (£1173.83)	£1039+VAT (£1220.83)
Intel Pentium® II 450	£1009+VAT (£1185.58)	£1049+VAT (£1232.58)	£1139+VAT (£1338.33)	£1179+VAT (£1385.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Prestige upgrades

64Mb to 96Mb RAM *(Celeron models)*	£40+VAT (£47.00)
64Mb to 128Mb RAM *(Pentium II models)*	£80+VAT (£94.00)
15" Taxan Ergovision 550 TCO95 monitor *(Celeron models)*	£30+VAT (£35.25)
17" EveshamVale monitor *(Celeron models)*	£85.11+VAT (£100.00)
17" Taxan Ergovision 760 TCO95 monitor *(Celeron models)*	£130+VAT (£152.75)
17" Taxan Ergovision 760 TCO95 monitor *(Pentium II models)*	£45+VAT (£52.88)
Diamond PCI v.90 56k voice capable modem	£49+VAT (£57.58)
Panasonic CW7582 recordable CD drive	£150+VAT (£176.25)
Adaptec Easy CD Creator software	£15+VAT (£17.63)
Desktop case *(illustrated page 8)*	£25+VAT (£29.38)
ValeStart installation service *(see page 5)*	£60+VAT (£70.50)

SpaceStation

Prestige Celeron 333MHz MULTIMEDIA PC with Taxan Crystalvision 640 TCO95-S flat panel LCD monitor
- 14.1" LCD panel with 1024 x 768 resolution
- Perfectly flat square display with no distortion
  - Similar screen area to a 17" conventional monitor
    - Only 170 mm overall depth including stand

£1149+VAT
Including (£1350.08) *the PC!*

Reviews

"The Prestige is a good machine at a very competitive price. If you're working to a tight budget, this machine must be at the top of your short list" **EveshamVale Prestige**

"Superb value in a machine which doesn't compromise on speed either. ...comes with such a good selection of peripherals and software that it scoops our Value award." **EveshamVale Prestige**

"A well specified system for the money, proving that a good PC can be built from Intel's newest budget CPU. The big question is the performance, and this proved to be good. Considering you're getting a fast high-spec PC from a well known company, the price seems very reasonable. The EveshamVale Prestige 333 is a well-rounded PC and shows what can be done with Intel's latest chip. If you're after decent performance at a reasonable price, it's a good choice." **EveshamVale Prestige 333**

"What is certainly more than adequate is the performance of the 333MHz Celeron, which gave a PC Plus index of 4.59, over 50% faster than some of the 6x86MXs in the group and a good 20% faster than the fastest K6-2...This machine is a little scorcher at a very competitive price" **EveshamVale Prestige 333 Performance 10/10**

"an excellent starter pack of software... Internally there is plenty of space to plug in any extra bits and pieces... I feel I'd have to recommend this machine to the beginner." **EveshamVale Prestige**

"A good, well-designed machine offering superb value for money." **EveshamVale Prestige**

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Christmas Specials

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Prestige Scorcher

Prestige Scorcher MULTIMEDIA models:

- Intel 440EX AGPset
- 128kb processor speed cache
- 64Mb SDRAM
- 6.4Gb hard disk
- 8Mb ATI Xpert98 AGP 3D graphics accelerator
- 15" EveshamVale monitor
- 32x CD-ROM drive
- On-board 16-bit audio
- Amplified speakers
- Diamond PCI v.90 56k voice capable modem
- Truly Internet ready (single click Internet access) - see page 5
- 2x Universal Serial Bus (USB) ports
- 14 day moneyback guarantee
- 2 years on-site maintenance for parts and labour
- Lifetime technical support hotline

BT Click
For direct internet access

Prestige Scorcher with optional 17" monitor (PC case stlye may vary)

Prestige Scorcher - 64Mb RAM, 6.4Gb HDD

Processor:	MULTIMEDIA	Media98+	Office
Intel Celeron™ 333	(£680.00) £799 inc VAT	(£816.17) £959 inc VAT	£819 +VAT (£962.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Prestige "BEST PC UNDER £1000"

These models are based on the recent review machine in *PC Pro*, which they wholeheartedly "recommended" and included in their 'A-List' as the "Best PC under £1000". We have now upgraded the hard disk to 8.4Gb, and still kept the price under £1000!

Prestige Scorcher with the following upgrades:

- Intel 440BX AGPset
- 64Mb SDRAM (100MHz)
- 8.4Gb Ultra ATA hard disk
- 17" EveshamVale monitor
- DVD-ROM drive (also works as CD-ROM drive)
- SoundBlaster PCI 64 wavetable sound

PC PRO RECOMMENDED — THE A LIST

"BEST PC under £1000" November 1998
"A top-value system with enough power and features for most users, including the latest SoundBlaster, DVD-ROM and 17" monitor." "Evesham's choice of motherboard is a solid foundation from which to build."

PERFORMANCE	○○○○○○
FEATURES	○○○○○○
VALUE FOR MONEY	○○○○○○
OVERALL	○○○○○○

Prestige BEST PC Under £1000 - 64Mb RAM, 8.4Gb HDD

Processor:	MULTIMEDIA	Media98+	Office
Intel Celeron™ 333	(£850.21) £999 inc VAT	(£986.38) £1159 inc VAT	£979 +VAT (£1150.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Prestige TNT

Maximum performance - Maximum upgradeability
Prestige TNT models use not only the brand new STB Velocity 4400 graphics accelerator (see p3 for details) - but also the very latest Intel BX chipset, with 128Mb of 100MHz SDRAM and capable of upgrade to the fastest Pentium II processor. So as well as having the performance to raise it above the competition now, the TNT has the upgradeability to keep it there.

Prestige Scorcher with the following upgrades:

- Intel 440BX AGPset
- 512kb cache (Pentium II 350MHz models)
- 128Mb SDRAM (100MHz)
- 8.4Gb Ultra ATA hard disk
- 16Mb STB Velocity 4400 2D/3D graphics accelerator
- 17" EveshamVale monitor
- SoundBlaster PCI 64 wavetable sound
- Zy-Fi Pro amplified speakers

PCAnswers verdict

- The fastest 2D/3D around
- Two texture units
- Great value

Overall 91%

EveshamVale Prestige TNT: 128Mb RAM, 8.4Gb HDD

Processor:	MULTIMEDIA	Media98+	Office
Intel Celeron™ 333	(£892.77) £1049 inc VAT	(£1028.94) £1209 inc VAT	£1019 +VAT (£1197.33)
Intel Pentium® II 350	(£977.87) £1149 inc VAT	(£1114.04) £1309 inc VAT	£1099 +VAT (£1291.33)
Intel Pentium® II 400	(£1105.53) £1299 inc VAT	(£1241.70) £1459 inc VAT	£1219 +VAT (£1432.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Media98+ models include all the Media98 extras plus a LEXMARK 1100 Colour Jetprinter

Add a splash of colour

The family colour printer with Disney's Print Studio CD-ROM

UPGRADE TO THE LEXMARK 3200

Upgrade the Lexmark 1100 to the award winning Lexmark 3200 photo quality printer for (59.57+VAT) £70 inc VAT

Microsoft software bundles

Available with any EveshamVale Multimedia or Media98 PC

Microsoft Office 97 Professional Edition — £99 (£116.33) +VAT
For the home user we offer Office97 Professional Student Edition*
Word 97 • Excel 97 • Outlook 97 • Access 97 • Powerpoint 97

Microsoft Office 97 Small Business Edition — £149 (£175.08) +VAT
Word 97 • Excel 97 • Outlook 97 • Publisher 97 • AutoRoute Express

Microsoft Office 97 Professional Edition — £239 (£280.83) +VAT
Word 97 • Excel 97 • Outlook 97 • Access 97 • Powerpoint 97

*To qualify for the Student Edition you must be a student or full or part time educator, on a Dept for Education & Employment (DfEE) recognised course, be aged 4 years or older. Product supplied via course specialist.
**Product supplied in Office97 Upgrade Pack, that is software product to upgrade from all Office 97 products supplied without course recommendation.

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Fax: 0121 683 6869	Fax: 01223 322 883	Fax: 01908 230 865	Fax: 0113 203 2001	Fax: 00 353 1 855 4440

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FREEPHONE DIRECT SALES 0800 496 0800 Web: http://www.evesham.com

Evesham Vale

BUY NOW PAY 1999 SEE PAGE 2 FOR DETAILS

Platinum

"THE BEST PC EVER"

EveshamVale Platinum - PC Pro

EveshamVale Platinum PCs have always been a favourite with reviewers – in fact *PC Pro* recently described one as "the best PC EVER". The current Platinum is an enhanced version of that review specification, with faster processors, more hard disk space and 17" Taxan monitor (instead of 15"). Despite the improvements, we have managed to *reduce* the price.

Platinum Multimedia PC in the Midi-Tower case

All Platinum models:

- Chaintech 6BTM motherboard with Intel 440BX AGPset, 100MHz bus, and SeePU and APTC technologies *(Pentium II models)*
- 128kb processor speed cache *(Celeron models)*
- 512kb cache *(Pentium II models)*
- 64Mb SDRAM, expandable to 256Mb (100MHz)
- 2x Universal Serial Bus (USB) ports
- 6.4Gb Ultra ATA high speed hard disk
- 8Mb ATI Xpert 98 AGP 3D graphics accelerator
- 17" Taxan Ergovision 735 TCO99 monitor with integral USB providing 4 USB ports.
- 32x CD-ROM drive
- SoundBlaster 64 PCI wavetable sound
- Amplified speakers
- High quality 'wheel' mouse
- 14 day moneyback guarantee
- 2 years on-site maintenance for parts and labour
- Lifetime technical support hotline
- Year 2000 ready BIOS
- 1 EPP parallel port and 2 serial ports with 16550 UART
- 3.5" 1.44Mb floppy disk drive
- Keytronic PS/2 'Windows 95' keyboard
- Choice of high quality ATX style desktop or midi-tower case
- TÜV approved power supply with low noise fan
- Windows98 installed, with full manuals and disks supplied (Windows95 is a no cost option)

Now Open On Sunday 10:00am - 16:00pm

Create your own CDs!

- Easily create data, audio and multimedia CDs on your PC.
- Send video postcards on CD that automitically play on any PC.
- Back up important files such as tax records, spreadsheets and financial data.

Panasonic CW7582 recordable CD drive ..... £150+VAT (£176.25)
Adaptec Easy CD Creator software ..... £15+VAT (£17.63)

Platinum Media98 models include the following Software:

- Microsoft Media98 software package (see p5 for details)

Platinum Office models include the following Software:

- Microsoft Office Small Business Edition (see p7 for details)

Microsoft Office 97

EveshamVale Platinum: 64Mb SDRAM, 6.4Gb HDD

	MULTIMEDIA	Media98	Office
Celeron™ 333	£799 +VAT (£938.83)	£889 +VAT (£1044.58)	£929 +VAT (£1091.58)
Pentium® II 350	£869 +VAT (£1021.08)	£959 +VAT (£1126.83)	£999 +VAT (£1173.83)
Pentium® II 400	£989 +VAT (£1162.08)	£1079 +VAT (£1267.83)	£1119 +VAT (£1314.83)
Pentium® II 450	£1129 +VAT (£1326.58)	£1219 +VAT (£1432.33)	£1259 +VAT (£1479.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Platinum upgrades

64Mb to 128Mb RAM	£80+VAT (£94.00)
64Mb to 256Mb RAM	£240+VAT (£282.00)
Diamond PCI v.90 56k voice capable modem	£49+VAT (£57.58)
DVD-ROM	£60+VAT (£70.50)
17" Taxan Ergovision 745 TCO99 monitor	£37+VAT (£43.48)
17" iiyama Vision Master 400 monitor	£100+VAT (£117.50)
17" iiyama Vision Master Pro 400 monitor	£125+VAT (£146.88)
17" Taxan 750 TCO95 monitor	£150+VAT (£176.25)
19" Taxan 975 TCO95 monitor	£170+VAT (£199.75)
21" Taxan 2160 TCO95 monitor	£570+VAT (£669.75)
Creative Labs SoundBlaster Live! value sound card	£45+VAT (£52.88)
Creative Labs SoundBlaster Live! sound card with FourPointSurround speaker system	£100+VAT (£117.50)
Panasonic LS-120 120Mb drive instead of 1.44Mb floppy drive	£50+VAT (£58.75)
CD-RW drive instead of CD-ROM drive	£150+VAT (£176.25)
Adaptec CD Creator software	£15+VAT (£17.63)
Maxtor DiamondMax 2500 10Gb hard disk	£120+VAT (£141.00)
Matrox G200 Millenium 8Mb video card	£40+VAT (£47.00)
ValeStart service *(see page 5 for full details)*	£60+VAT (£70.50)

Reviews Platinum Range

"Fastest PC"

PC PRO SPEED

"The Vale Platinum PII/400 is the latest in a series of ever-more powerful machines we've recently seen from Evesham... Evesham's system is one for the hardcore speed freaks... The PC equivalent of a land-speed record holder... All too predictably, the Platinum 400 knocks the Platinum 333 off its perch as the fastest system yet seen in *PC Pro*... if you must have the fastest PC currently known to man, or at least man at *PC Pro*, then this is it" **EveshamVale Platinum**

PC MAGAZINE VALUE FOR MONEY VFM

"A great choice" "Good features make this the best choice at this lower end of the price range" "...the two-year on-site warranty is excellent value. Overall this is a system whose features belie its low price." **EveshamVale Platinum, PC Magazine, Value for Money**

PC Plus

"We can always rely on Evesham to come up with something good..." "The Platinum is an unpretentious machine with a lot under the hood."

"Add in a two year, on-site warranty to the machine and you have a high value bundle which few suppliers can touch. This is a machine which should last you well to the millennium and is a sound buy for serious home use and the odd game. It's well worth a *PC Plus* Gold." **PC Plus Verdict: 10/10 EveshamVale Platinum**

Personal Computer World

"It's easy to set up and the user manual is informative, well written and illustrated."

"Evesham Micros gets a special mention for future-proofing its PC with a DVD-ROM drive" "the insides of this PC are a tribute to good housekeeping" "GOOD POINTS: Performance, ease of use and instalation, warranty, monitor, DVD-ROM drive" **EveshamVale Platinum**

Personal Computer World HIGHLY COMMENDED

"the machine excelled in our benchmark tests, benefiting from a speedy hard drive."

"The Vale came with a 17" Taxan monitor offering a clear, steady, flicker-free image." "A machine to suit most business needs." **EveshamVale Platinum**

BEST BUY SOFTWARE LABS

"This is a well specified system... and is configured appropriately for both home and games usage, delivering very good performance."

"Evesham's Vale gets our vote for it's overall level of presentation." **EveshamVale Platinum**

"BEST PC"

PC PRO SPEED

"We put 18 machines through their paces. Only two come up trumps, and one is the best PC we've ever seen."

"Evesham has created a lightning-fast PC at a really low price point. If you want cutting-edge technology, without taking out a second mortgage, look no further. This is a worthy speed award winner." **EveshamVale Platinum, PC Pro**

VALUE PC Plus

"Evesham's latest Pentium II machine is not so much a Vale as a high plateau... Performance of the Platinum PII-333 was very strong... With a two year, on-site warranty thrown in, this Vale Platinum PII-333 wins a deserved Value for Money award." **EveshamVale Platinum**

Personal Computer World

"1 year test"

"Based on price and quick delivery times, I decided to go with Evesham Micros" "GOOD POINTS: Fast, expandable, quiet fan" "CONCLUSION: I'm very happy" **EveshamVale Platinum**

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EveshamVale

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SEE PAGE 2 FOR DETAILS

Platinum TNT Live!

Platinum TNT models have the following enhancements to Platinum models:

- 128Mb SDRAM (100MHz)
- 10.2Gb Quantum Fireball EL hard disk
- 16Mb STB Velocity 4400 2D/3D graphics accelerator (see page 3)
- Creative Labs SoundBlaster Live! value sound card (see page 3)
- Creative Labs PCWorks FourPointSurround speaker system
- Diamond PCI v.90 56k voice capable modem
- Truly Internet ready (see page 5)

Other features as Platinum models

See p5 for details of Media98 software.

Microsoft Office97
See p7 for details of the Microsoft SBE software pack

PCWORKS – FourPointSurround

Speaker 5

The latest speaker sound system from Creative Labs to fully utilise the advanced Environmental Audio™ and Creative Multi Speaker Support™ abilities of the SB Live! card.

- Four 2.75" wide satellite speaker cubes
- Compact, floor standing powered subwoofer
- Remote in-line master volume control

Platinum TNT Live! in the optional desk-top case

EveshamVale Platinum TNT: 128Mb SDRAM, 10.2Gb HDD

	MULTIMEDIA	Media98	Office
Celeron™ 333	£1099 +VAT (£1291.33)	£1189 +VAT (£1397.08)	£1229 +VAT (£1444.08)
Pentium® II 350	£1169 +VAT (£1373.58)	£1259 +VAT (£1479.33)	£1299 +VAT (£1526.33)
Pentium® II 400	£1289 +VAT (£1514.58)	£1379 +VAT (£1620.33)	£1419 +VAT (£1667.33)
Pentium® II 450	£1429 +VAT (£1679.08)	£1519 +VAT (£1784.83)	£1559 +VAT (£1831.83)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

Platinum TNT Live! upgrades

128Mb to 256Mb RAM ..... £160+VAT (£188.00)

SEE PLATINUM MODELS FOR OTHER UPGRADES

STB VELOCITY 4400

The new VELOCITY 4400 uses the NVIDIA RIVA TNT graphics engine to deliver performance that simply blows away everything that has come before!

(see page 3 for more details)

Platinum Wonder

"We have no hesitation in declaring the SoundBlaster Live! to be the most significant advance in PC audio since the development of the soundcard itself" **PC Review 9/10**

"THE BEST" GETS BETTER

The Platinum Wonder is the affordable 'ultimate' PC. Like the rest of the Platinum range it is based on our proven formula of the very best components, solid and reliable build quality, and award winning customer care.

"The SB Live! will do for sound, what Voodoo did for graphics" **95% PC Format**

PC Format GOLD AWARD

Platinum Wonder key features:

- Intel 440BX AGPset (100MHz bus)
- 128Mb SDRAM (100MHz)
- 10Gb Maxtor DiamondMax 2500 (The fastest IDE hard disk available)
- ATI 8Mb All-in-Wonder Pro AGP video card
- 12Mb Voodoo 2 3Dfx card
- 19" Taxan Ergovision 975 TCO95 monitor
- DVD-ROM drive (also works as CD-ROM drive)
- Creative Labs SoundBlaster Live! value sound card (see page 3)
- Creative Labs PCWorks FourPointSurround speaker system
- Iomega zip drive
- Diamond PCI v.90 56k voice capable modem
- Truly Internet ready (see page 5)
- Microsoft Natural keyboard

Other features as Platinum models

DVD ROM

Platinum Wonder upgrades

128Mb to 256Mb RAM ..... £160+VAT (£188.00)
Upgrade to 21" Taxan 2160 monitor ..... £390+VAT (£458.25)
10 pack CD-R disks ..... £20+VAT (£23.50)
DVD-RAM (rewritable) drive instead of DVD-ROM drive ..... £380+VAT (£446.50)
(Includes SCSI controller card)
HP Surestore CD-RW 8100 CD-ROM writer ..... £259+VAT (£304.33)
2x 9Gb Quantum Viking II LVD SCSI super fast hard disks with Adaptec 2940 LVD U2W SCSI controller
(This option includes an upgrade to the High Tower case as illustrated on P13) ..... £899+VAT (£1056.33)

SEE PLATINUM MODELS FOR OTHER UPGRADES

Platinum Wonder: 128Mb SDRAM, 10Gb HDD

	MULTIMEDIA	Media98
Pentium® II 350	£1549 +VAT (£1820.08)	£1639 +VAT (£1925.83)
Pentium® II 400	£1669 +VAT (£1961.08)	£1759 +VAT (£2066.83)
Pentium® II 450	£1809 +VAT (£2125.58)	£1899 +VAT (£2231.33)

Prices highlighted are "Ready to Ship" models which we try to keep in stock for immediate despatch.

PC MAGAZINE EDITORS' CHOICE

ATI All-in-Wonder Pro
The 7-in-1 TV, graphics and multimedia board

ATI All-in-Wonder Pro
The 7-in-1 TV, graphics and multimedia board

The heart of the incredible video capabilities of the Platinum Wonder is ATI's new All-in-Wonder Pro card. This combines the acclaimed *3D Rage Pro* graphics accelerator found in the Xpert@work with a host of multimedia functions

PC PRO

"All in all, this is an extremely impressive package... when you bear in mind the price you could expect to pay for all those extra bits on board, it's something of a bargain... Just for once, this is a product that does everything it sets out to do, and it does it all well." **All-in-Wonder Pro**

Microsoft software bundles

Available with any EveshamVale Multimedia or Media98 PC – see page 7 for details

BIRMINGHAM	CAMBRIDGE	MILTON KEYNES	LEEDS	DUBLIN
0121 683 6868	01223 323 898	01908 230 898	0113 203 2000	00 353 1 855 4444
Fax: 0121 683 6869	Fax: 01223 322 883	Fax: 01908 230 865	Fax: 0113 203 2001	Fax: 00 353 1 855 4440

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Evesham Vale

BUY NOW PAY 1999 SEE PAGE 2 FOR DETAILS

Voyager 2500

800 x 600

Voyager 2500 MULTIMEDIA models:
- 2 year warranty, with accidental damage insurance
- 256kb asynchronous cache
- 32Mb EDO RAM
- 5Gb hard disk
- 2Mb 64bit PCI graphics accelerator
- 12.1" TFT colour display with 800x600 SVGA resolution
- 20x CD-ROM drive
- 3.5" floppy drive
- Nickel MetalHydride battery
- Extensive power management features, including 'suspend to RAM' and 'suspend to disk'

Voyager 2500 models also feature:
- Good solid keyboard with Windows95 keys
- Built-in touchpad with palm rest
- Built-in 16bit stereo sound with stereo speakers and microphone
- ZV-enabled PCMCIA ports for two type II or one type III card
- 16550 compatible serial port
- EPP/ECP bi-directional parallel port
- PS/2 mouse or keyboard port
- External monitor port (runs simultaneously)
- Jacks for external speakers and stereo line in
- Infra red data link
- Anchor for Kensington security cable
- Windows98 installed (Windows95 is a no cost option)

Voyager 2500 Office models also have:
- Microsoft Office97 Small Business Edition (see page 7)

Microsoft Office97

Voyager 2500 – 12.1" TFT display, NiMH battery	MULTIMEDIA (TFT)	Office (TFT)
AMD K6 300	£949+VAT (£1115.08)	£1089+VAT (£1279.58)

Voyager 2500 upgrades

32Mb to 96Mb RAM	£75+VAT (£88.13)
Car cigar lighter adaptor	£79+VAT (£92.83)
EveshamVale 56K PCMCIA modem	£79+VAT (£92.83)
EveshamVale ethernet adaptor	£59+VAT (£69.33)

Voyager 2500

WHAT PC? "quality screen... good colour and contrast: it is also visible from a good range of angles." "The keyboard is comfortable to type on." EveshamVale Voyager 2000

Voyager 2800

WHAT PC? Testdrive "When he looked at the EveshamVale Voyager 2000's specification, Tim found it hard to believe it fell within his budget." "In the end, the EveshamVale Voyager 2000 looked the most promising." EveshamVale Voyager 2000

A fully featured Pentium II 233MHz notebook with 13.3" TFT display, 5Gb HDD and 96Mb RAM for only £1199+VAT !!

1024 x 768

Voyager 2800 MULTIMEDIA models:
- 2 year warranty, with accidental damage insurance
- Low voltage Intel Mobile Pentium® II processor
- 13.3" TFT colour display with 1024 x 768 resolution
- 512kb cache
- 96Mb RAM
- 5Gb hard disk
- 24x CD-ROM drive
- 2Mb 64bit PCI graphics accelerator
- 3.5" floppy drive
- Nickel MetalHydride battery
- Extensive power management features, including 'suspend to RAM' and 'suspend to disk'

Voyager 2800 models also feature:
- Good solid keyboard with Windows95 keys
- Built-in touchpad with palm rest
- Built-in 16bit stereo sound with stereo speakers and microphone
- ZV-enabled PCMCIA ports for two type II or one type III card
- 16550 compatible serial port
- EPP/ECP bi-directional parallel port
- PS/2 mouse or keyboard port
- External monitor port (runs simultaneously)
- Jacks for external speakers and stereo line in
- Infra red data link
- Anchor for Kensington security cable
- Windows98 installed (Windows95 is a no cost option)

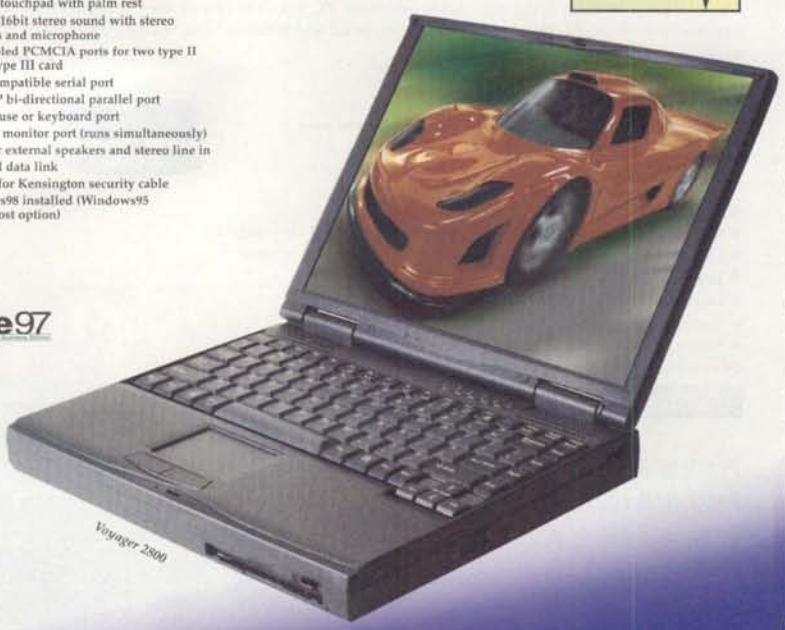
Voyager 2800 Office models also have:
- Microsoft Office97 Small Business Edition (see page 7)

Microsoft Office97

Voyager 2800 – 13.3" TFT display, NiMH battery	MULTIMEDIA (TFT)	Office (TFT)
Pentium® II 233	£1199+VAT (£1408.83)	£1339+VAT (£1573.33)
Pentium® II 266	£1349+VAT (£1585.08)	£1489+VAT (£1749.58)
Pentium® II 300	£1499+VAT (£1761.33)	£1489+VAT (£1749.58)

Voyager 2800 upgrades

Car cigar lighter adaptor	£79+VAT (£92.83)
EveshamVale 56K PCMCIA modem	£79+VAT (£92.83)
EveshamVale ethernet adaptor	£59+VAT (£69.33)


Voyager 2800

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EveshamVale

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SEE PAGE 2 FOR DETAILS

Voyager 4000

1024 x 768

MMX™ intel inside pentium® II PROCESSOR

Slim, stylish and powered by Pentium® II!

If you want the most sophisticated and stylish Notebook on the market then the Voyager 4000 is the one to look at. It combines the class leading performance of the Pentium® II mobile processor with a battery life that leaves it's competitors behind. Manufactured to the highest standards, the overall quality of the fit and finish is superb; its high-tech performance is certainly matched by its svelte appearance.

Voyager 4000 MULTIMEDIA models:

- 2 year warranty, with accidental damage insurance
- Li-Ion battery and extensive power management features give superb battery life with minimum weight
- Low voltage Intel Mobile Pentium® II processor also maximises battery life
- Automatically tilting keyboard for maximum typing comfort
- 512kb Pipeline-Burst cache
- 80Mb SDRAM
- 6.4Gb enhanced IDE hard disk
- 2Mb high performance graphics accelerator with support for MPEG-1 video playback
- 13.3" TFT display with 1024x768 resolution and 64000 colour palette
- 20 speed CD-ROM drive built-in
- USB port
- Super slim design with superior quality fit and finish

Voyager 4000 Office models also have:

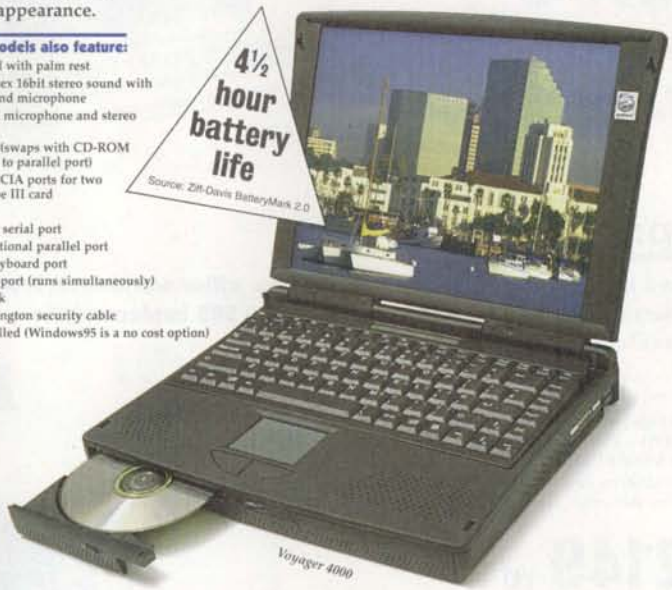
- Microsoft Office97 Small Business Edition (see page 7)

Microsoft Office 97

Voyager 4000 models also feature:

- Built-in touchpad with palm rest
- Built-in full duplex 16bit stereo sound with stereo speakers and microphone
- Jacks for external microphone and stereo line in/out
- 3.5" floppy drive (swaps with CD-ROM drive or connects to parallel port)
- ZV-enabled PCMCIA ports for two type II or one type III card
- MIDI/game port
- 16550 compatible serial port
- EPP/ECP bi-directional parallel port
- PS/2 mouse or keyboard port
- External monitor port (runs simultaneously)
- Infra red data link
- Anchor for Kensington security cable
- Windows98 installed (Windows95 is a no cost option)
- 334 x 250 x 51mm
- 4.75kg

4½ hour battery life
Source: Ziff-Davis BatteryMark 2.0



Voyager 4000 – 13.3" TFT display, Li-Ion battery	MULTIMEDIA (TFT)	Office (TFT)
Pentium® II 233	£1799+VAT (£2113.83)	£1939+VAT (£2278.33)
Pentium® II 266	£1999+VAT (£2348.83)	£2139+VAT (£2513.33)
Pentium® II 300	£2249+VAT (£2642.58)	£2389+VAT (£2807.08)

Voyager 4000 upgrades

Car cigar lighter adaptor	£79+VAT (£92.83)
Second battery	£129+VAT (£151.58)
Port replicator	£149+VAT (£175.08)
EveshamVale 56K PCMCIA modem	£79+VAT (£92.83)
EveshamVale ethernet adaptor	£59+VAT (£69.33)

BUY IT! computer active

"The Voyager was the heavier... but it was clearly more robust. It also had an attractive rubberised coating"
"When the lid is opened the keyboard raises slightly at the rear to provide an improved typing angle, which makes the machine more comfortable than the average to use."
EveshamVale Voyager 4000

We've got you covered...

2 YEAR WARRANTY WITH ACCIDENTAL DAMAGE INSURANCE

On-site maintenance is not really practical with notebook computers – but how many of our competitors look after you this well? All Voyager notebooks have a *two year* 'return to base' warranty with *accidental damage insurance* as well! For a modest sum you can extend this peace of mind to three years.

3RD YEAR WARRANTY

Models up to £1700+VAT	£99
Models from £1700+VAT to £2500+VAT	£129
Models from £2500+VAT to £3200+VAT	£179

The extended warranty rates are exempt from VAT and are applicable only at time of purchase.

Now Open On Sunday
10:00am – 16:00pm

Computer Luggage

Stylish, practical carry cases for your notebook and accessories.

£63+VAT

£50+VAT

New York (back pack)
£35+VAT (£41.13)

Madrid
£30+VAT (£35.25)

Microsoft software bundles

Available with any EveshamVale Multimedia or Media98 PC – see page 7 for details

BIRMINGHAM	CAMBRIDGE	MILTON KEYNES	LEEDS	DUBLIN
0121 683 6868	01223 323 898	01908 230 898	0113 203 2000	00 353 1 855 4444
Fax: 0121 683 6869	Fax: 01223 322 883	Fax: 01908 230 865	Fax: 0113 203 2001	Fax: 00 353 1 855 4440

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Evesham Vale

3 year on-site maintenance Fully Guaranteed

Prestige

The Prestige offers an entry level solution to your business requirements.

- Intel Celeron® 333MHz processor
- Intel 440EX AGPset
- 64Mb SDRAM
- 4Gb Hard Disk
- ATI 4Mb 3D Charger AGP video card
- 15" EveshamVale Monitor

(See page 6 for full details of Prestige models)

£579+VAT

Evesham Finance example: £20.83+VAT per month*

Prestige workstation

Prestige upgrades

64Mb to 96Mb RAM ..... £40+VAT

Rapier Server

Fast and reliable, the Rapier Server is a real office workhorse. From a modest print and file server to a powerfull SBS implementation, the possibilities are endless.

- Intel Pentium® II 400MHz processor (upgradeable to dual processors)
- 128Mb high performance RAM
- Safety first – 9Gb Ultra Wide SCSI hard disk and dual redundant PSUs
- Dedicated server case for maximum expansion potential

£2149+VAT

Evesham Finance example: £77.30+VAT per month*

Rapier Server (closed case)

Speed
Performance
Connectivity
True Multitasking
SCSI
adaptec

Rapier Server upgrades

P II-400 to dual P II-400 processor ..... £400+VAT
128Mb to 256Mb RAM ..... £160+VAT
4/8Gb DAT drive ..... £650+VAT
12/24Gb DAT drive ..... £799+VAT

Samurai RAID Server

Safe, secure and powerful – the Samurai RAID Server uses industry proven technology to give you the peace of mind that comes from knowing that your data integrity will be maintained.

- Intel Pentium® II 400MHz processor (upgradeable to dual processors)
- Maximum data protection with 27Gb Ultra Wide RAID 5 hot swappable hard disks
- Handle applications with 128Mb high performance RAM
- Delivered and commissioned on-site free of charge

£3399+VAT

Evesham Finance example: £122.26+VAT per month*

Samurai RAID Server (open case)

Data Protection
Performance
Scalability
Manageability
RAID
adaptec

Samurai RAID Server upgrades

P II-400 to dual P II-400 processor ..... £400+VAT
128Mb to 256Mb RAM ..... £160+VAT
4/8Gb DAT drive ..... £650+VAT
12/24Gb DAT drive ..... £799+VAT

Evesham Micros

Business Sales Centres:

- Put a face to your business partner with a dedicated account manager
- Local experience and on the spot advice
- Voted best "Product knowledge of sales staff" in Computer Weekly survey
- Local technical support and engineering

Novell. Novell. Authorised Reseller PartnerNet. Education CNE Microsoft Certified Solution Provider Microsoft Certified Professional Product Specialist

Does your network have up to 25 users?

Microsoft BackOffice Small Business Server

Microsoft BackOffice Small Business Server (SBS) helps provide easier ways to run your business

- **A reliable and stable network operating system for business applications**
- **Efficient file and printer sharing between users**
- **Communicate with colleagues and customers through secure e-mail**
- **Gain controlled access to the Internet.**
- **Without the expense and luxury of a full-time IT specialist on the payroll!**

Ultimately, ***SBS*** combined with an ***EveshamVale server*** and the ***right advice*** provides the complete solution that makes it easy to ***grow*** and manage ***your company.***

From £999+VAT for a 5 client license

Evesham FINANCE

All equipment and services from Evesham Micros can be financed through Evesham Finance.

Why Evesham Finance?

- Spread the cost of equipment over realistic life
- No large capital outlay
- Payments inflation proof
- Automatic Change Out Options
- 100% tax allowable as a revenue expense
- Specialist Finance solutions for all Businesses and Public sector

For an immediate free consultation call Evesham Finance Helpdesk on

0800 496 0600

*Evesham Finance examples are for a 3 year period. This facility is offered subject to status.

Evesham Micros

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0800 389 9393
Web: http://www.evesham.com

FREEPHONE BUSINESS SALES 0800 389 9393 Web: http://www.evesham.com

Evesham Vale

PROFESSIONAL

Dublin Branch
Now Open
Tel: 00 353 1 855 4444

FREEPHONE BUSINESS SALES
will route you to your nearest branch

0800 389 9393

EVESHAM (fax 01386 769781)
BIRMINGHAM (fax 0121 683 6869)
CAMBRIDGE (fax 01223 322883)
MILTON KEYNES (fax 01908 230865)
LEEDS (fax 0113 203 2001)
GLASGOW (fax 0141 445 2626)

"Don't log on - the network's down..."

"My printer's not working!"

"Who's got the data backup??"

Sound Familiar? How much does this currently cost your company?

Free network health check
worth up to £500

Do you qualify? Call 0800 389 9393 and ask.

3 year on-site maintenance Parts & Labour

All EveshamVale Servers and DesignStations have 3 years on-site maintenance for parts and labour, operated by Evesham Micros' own engineers, with next business day response.

CALL OUR EXPERTS NOW FOR ALL YOUR SOFTWARE & LICENSING REQUIREMENTS

Quad processor capable

ZenQua Server

Pentium® II Xeon™ processor(s)

The ultimate solution to your mission critical system requirements: the ZenQua Server is the server you can depend on

DUAL or QUAD

intel inside pentium® II xeon™ processor

- Dual Intel Pentium® II Xeon 400MHz processors with 1Mb cache (upgradeable to quad processors)
- 54Gb RAID array
- 512Mb high performance RAM
- Delivered and commissioned on-site free of charge

£12999 +VAT

Evesham Finance example:
£460.42+VAT per month*

Closed view

Speed
Performance
Connectivity
True Multitasking
SCSI
adaptec

ZenQua Server

ZenQua Server upgrades

Pentium II Xeon 400MHz 1Mb cache	£1700+VAT
512Mb memory board upgrade	£700+VAT
Rack mount kit	£150+VAT
HP DLT 40Gb internal storage	£2199+VAT
HP DLT 70Gb external storage	£4799+VAT

This is an example configuration – call us on 0800 389 9393 to discuss your specific requirements

DesignStation

Experience astonishing performance – at a fraction of the cost of a typical workstation from the likes of Sun or Silicon Graphics.

DUAL

intel inside pentium® II xeon™ processor

- Dual Intel Pentium® II Xeon 400MHz processors with 512kb cache
- 128Mb SDRAM
- 2x 9Gb SCSI hard disks with Adaptec 2940 LVD U2W controller
- Diamond Fire GL1000 8Mb professional video card
- 21" Taxan Ergovision 2160 TCO95 monitor with DiamondTron tube

£3999 +VAT

Evesham Finance example:
£143.84+VAT per month*

DesignStation

DesignStation upgrades

128Mb to 256Mb RAM	£240+VAT
4/8Gb DAT drive	£650+VAT
12/24Gb DAT drive	£799+VAT

FREEPHONE BUSINESS SALES
0800 389 9393
Web: http://www.evesham.com

Evesham Micros

EveshamVale
FREEPHONE BUSINESS SALES
0800 389 9393
Web: http://www.evesham.com

Evesham Micros Peripherals

FREEPHONE DIRECT SALES 0800 496 0800 Web: http://www.evesham.com

MOTHERBOARDS

Buy a motherboard and processor together, and you get a free heatsink and fan.

Name	Form factor	Processor support			Chipset	Cache	RAM support		Exp. slots			USB	Price
		K6	Pentium	Pentium II			Fast page/EDO	SD	ISA	PCI	AGP		
Chaintech 5TDM	Baby AT	●	●		430TX	512kb	●	●	3*	4*		Opt†	£45+VAT (£52.88)
Chaintech 5TTM	ATX	●	●		430TX	512kb	●	●	4*	4*		Opt†	£45+VAT (£52.88)
Chaintech 6ESA	ATX			●	430EX	on CPU	●	●	2*	2*	1	●	£59+VAT (£69.33)
Chaintech 6LTM-2	ATX			●	440LX	on CPU		●	2*	4*	1	●	£61+VAT (£71.68)
Chaintech 6BTM	ATX			●	440BX	on CPU	●	●	3*	4*	1	●	£79+VAT (£92.83)

Note some motherboard features may not work without Windows 98 *One slot shared †Use of USB requires cable @ £5+VAT (£5.88)

CHAINTECH COMPUTER CO., LTD.

RUN!PC "Technology Creativity" award, Chaintech 5TDM & 5TTM

SeePU Innovative simple CPU installation via BIOS – no jumpers

APTC High security Active Processor Temperature Control – multi-level CPU temperature protection function

PC Shopping Bay Top — Chaintech 5TDM

Chaintech 5TDM

AnandTech

5TTM
"features the spectacular SeePU jumperless CPU setup"
"I suggest that you seriously consider the Chaintech 5TTM"

6ESA
"...don't underestimate the power this puppy packs. Its meek bark is made up for by sheer power..."
"...you can enjoy the awesome FPU performance of a Celeron/6ESA combo for a previously unheard of price..."
AnandTech's website

Ratings:
Performance ★★★★☆
Ease of use ★★★★★
Documentation ★★★★★

6BTM
"This mainboard offers a lot of functionality and good performance figures for a good price."
"Nice manual with stickers, 4 DIMMs and temperature probe, very good price." Computer! Totaal (Netherlands)

6LTM-2
"...the 6LTM certainly proved one of the most reliable."
"If your looking for a motherboard to overclock your PII on , you can't do much better than this wonderful fully featured board."
PC Format - Rating 91%

PC Format Gold Award — Chaintech 6LTM-2

UPGRADE PACKS

TX Based Bundles

430TX motherboard, Winchip 200 & Fan ..... £79+VAT (£92.83)

430TX motherboard, Winchip 200, Fan & Case ..... £99+VAT (£116.33)

EX Based Bundles

Chaintech 6ESA Motherboard, Celeron 333MHz, Cooler & 32Mb ..... £199+VAT (£233.83)

BX Based Bundles

Chaintech 6BTM Motherboard, Celeron 333, Cooler, 64Mb PC100 SDRAM ... £209+VAT (£245.58)

Chaintech 6BTM Motherboard, Pentium II-350, Cooler, 64Mb PC100 SDRAM ... £289+VAT (£339.58)

Chaintech 6BTM Motherboard, Pentium II-400, Cooler, 128Mb PC100 SDRAM £469+VAT (£551.08)

Windows 98 CD (only available with bundle) ..... £59+VAT (£69.33)

Note - some motherboard features may not be supported without upgrading to Windows 98

CASES WITH POWER SUPPLY

Style	Form factor	Drive bays		Price
		Internal	External	
Mini-tower	Baby AT	2x3.5"	3x5.25" 2x3.5"	£29+VAT (£34.08)
Desktop	ATX	1x5.25" 2x3.5"	2x5.25" 1x3.5"	£59+VAT (£69.33)
Mini-tower	ATX	3x3.5"	2x5.25" 3x3.5"	£49+VAT (£57.58)

PROCESSORS

Celeron 333 ..... £119+VAT (£139.83)
Pentium II 350 ..... £159+VAT (£186.83)
Pentium II 400 ..... £279+VAT (£327.83)

MEMORY MODULES

4Mb 72-pin ..... £12+VAT (£14.10)
8Mb 72-pin ..... £19+VAT (£22.33)
16Mb 72-pin ..... £35+VAT (£41.13)
4Mb EDO ..... £11+VAT (£12.93)
8Mb EDO ..... £18+VAT (£21.15)
16Mb EDO ..... £34+VAT (£39.95)
32Mb EDO ..... £69+VAT (£81.08)

SDRAM DIMMs
32Mb ..... £40+VAT (£47.00)
64Mb PC100 ..... £90+VAT (£105.78)
128Mb PC100 ..... £170+VAT (£199.75)

Twinhead Slimnnote memory
8Mb for SL7 ..... £39+VAT (£45.83)
16Mb for SL7 ..... £69+VAT (£81.08)
32Mb for SL7 ..... £109+VAT (£128.08)
16Mb for SL9 ..... £59+VAT (£69.33)

120MB FLOPPY DRIVE

LS-120 internal with controller card ..... £79+VAT (£92.83)
LS-120 internal no controller card ..... £55+VAT (£64.63)
120Mb floppy disk ..... £14+VAT (£16.45)
Panasonic 1.44Mb floppy disk drive ..... £15+VAT (£17.63)

STORAGE & BACKUP

Iomega ditto tape drives:
Tapes for ditto 2Gb ..... 3 pack £39+VAT (£45.83)
Tapes for ditto 3.2Gb ..... £25+VAT (£29.38)

Iomega ditto Max tape drives:
Tapes for ditto Max 7Gb ..... 2 pack £35+VAT (£41.13)
10Gb Internal ..... £184+VAT (£216.20)
Tapes for ditto Max 10Gb ..... £22+VAT (£25.85)
All ditto capacities quoted are with 2x compression

Iomega zip drives:
Zip ext drive 'parallel port' ..... £95+VAT (£111.63)
Zip ext SCSI ..... £95+VAT (£111.63)
Cartridge for zip drive ..... £12+VAT (£14.10)
Cartridge for zip drive ..... 6 pack £55+VAT (£64.63)
Battery pack for zip drive ..... £49+VAT (£57.58)

Iomega 1Gb jaz drives:
Cartridge ..... £69+VAT (£81.08)

Iomega 2Gb jaz drives:
internal ..... £349+VAT (£410.08)
external ..... £419+VAT (£492.33)
SCSI card ..... £69+VAT (£81.08)
Cartridge ..... 3 pack £279+VAT (£327.83)

SureStore 12/24Gb DAT drive ..... £799+VAT (£938.83)

Seagate 120m DAT tape ..... £25+VAT (£29.38)
4/8Gb internal DAT drive ..... £650+VAT (£763.75)

HARD DISKS & CONTROLLERS

Optional installation kit (5.25" mounting bracket plus cables) ... £10+VAT (£11.75)

Quantum
Fireball EL 7.6Gb Ultra-ATA ..... £149+VAT (£175.08)
Viking II LVD 4.5Gb SCSI (3.5") ..... £235+VAT (£276.13)
Viking II LVD 9Gb SCSI (3.5") ..... £399+VAT (£468.83)

Seagate 1.2Gb IDE ..... £79+VAT (£92.83)

Samsung Electronics
6.4Gb IDE ..... £105+VAT (£123.38)
8.4Gb IDE ..... £129+VAT (£151.58)

Promise Technology Inc
Promise PCI Ultra ATA controller ..... £49+VAT (£57.58)

MODEMS

Evesham Vale

Quality hardware voice modems

- Internet access starter pack: includes full Internet and World Wide Web access software, with first month membership free and 10 hours free on-line time
- Cables included
- K56flex units include SuperVoice software
- v.90 ready

K56flex internal ..... £49+VAT (£57.58)

K56flex external ..... £59+VAT (£69.33)
56k PCMCIA (not voice) ..... £79+VAT (£92.83)

ISDN card ..... £99+VAT (£116.33)

- Plug & Play 16 bit ISDN card
- 32 bit VxD CAPI 2.0 driver
- Answering machine
- Telephone book/call log
- Telephone through port
- RVS-COM software for Windows 95/NT provides Microsoft Internet Explorer, Fax group 3 reception/ transmission, and E-mail

Pace
56 Voice internal ..... £79+VAT (£92.83)
56 Voice external (supports UK caller ID) .... £109+VAT (£128.08)
56 PCMCIA ..... £99+VAT (£116.33)
56 Solo ..... £155+VAT (£182.13)

U.S. Robotics
Sportster 56.6 Flash external ... £92+VAT (£108.10)
Sportster Message Plus ..... £135+VAT (£158.63)
Courier ISDN internal ..... £259+VAT (£304.33)
Courier ISDN external ..... £259+VAT (£304.33)

All modems include Internet connection software with free trial connection period.

Network Products

Evesham Vale
PCI ethernet adaptor ..... £29+VAT (£34.08)
PCMCIA ethernet adaptor ..... £59+VAT (£69.33)

Intel
Pro 10/100 PCI ..... £55+VAT (£64.63)
Pro 10/100 PCI ..... 5 pack £259+VAT (£304.33)
10Mbps 5 port hub ..... £45+VAT (£52.88)
10Mbps 8 port hub with BNC ..... £65+VAT (£76.38)
100Mbps 4 port fast hub ..... £135+VAT (£158.63)
100Mbps 8 port fast hub ..... £245+VAT (£287.88)
100Mbps 8 port fast hub with 10/100 bridge port ..... £485+VAT (£569.88)
10Mbps 8 port switch ..... £365+VAT (£428.88)
10Mbps 8 port switch with two 10/100 bridge ports ..... £499+VAT (£586.33)
Internet station ..... £275+VAT (£323.13)

- The cost effective way to share one internet connection over your 10Base-T network
- Uses analog or ISDN modems
- Use up to two additional modems to share fax services, bulletin board access etc.

hp
Jet Direct External Plus 3 ..... £265+VAT (£311.38)

3Com
3C509 Combo ..... £75+VAT (£88.13)
3C589 PCMCIA Combo ..... £119+VAT (£139.83)
OfficeConnect products:
3C16704 Hub TP4 ..... £51+VAT (£59.93)
3C16700 Hub 8/TPO ..... £79+VAT (£92.83)
3C16702 Hub TP16C ..... £175+VAT (£205.63)
3C16720 Hub 8/TP100 ..... £485+VAT (£569.88)

UPSs

Evesham Vale

Protect your installation from mains power faults with an uninterruptible power supply.

Station series UPSs
- Reliable protection from mains surges, spikes, noise and failure
- Interface port and power management software for automatic system shutdown and remote alarm notification by paging/email

Station 280 (280VA) ... £99+VAT (£116.33)
Station 420 (420VA) £129+VAT (£151.58)
Station 650 (650VA) £189+VAT (£222.08)
Station 1000 (1kVA) £249+VAT (£292.58)

System series on-line UPSs
- PowerSave software and intelligent interface allows comprehensive monitoring and control, plus automated alarm and shutdown routines

System 1000 (1kVA) ..... £599+VAT (£703.83)
System 3000 (3kVA) ..... £1249+VAT (£1467.58)

Mustek FLATBED SCANNING from £45+VAT (£52.88)

- All Mustek Scanexpress flatbeds use *single-pass* scanning – much faster than models which scan each colour separately
- Colour, 8-bit grey and line art modes
- 12 built-in halftoning patterns
- Simply connects to your parallel port for easy installation
- 'Small footprint' design with compact exterior dimensions and 216mm x 296mm scan area
- Includes *iPhoto Plus* image scanning and photograph re-touching software, and powerful *Textbridge OCR* software

Requirements: Pentium processor, Windows 95, mouse, CD-ROM drive, SVGA graphics or higher, at least 16Mb RAM, and hard disk with at least 70Mb free

PLEASE NOTE
remember that large scans at high resolution require a lot of RAM (or a lot of hard disk space and patience). For example, an A4 document scanned in 24 bit colour at 300dpi is 24Mb. At 600dpi it is 96Mb!

"...ease of use, great colour quality and exemplary OCR output ...offers both low price and impressive speed via its Enhanced Parallel Port interface ...fast and easy to setup–just five minutes and you're done" Mustek 600

PC FORMAT
"The bundled software is impressive... The scans themselves...are satisfying and higher than you could reasonably expect for the price. The design of the case is sleek and it's compact enough to fit on the smallest desktop." Mustek 600

"Mono text has excellent contrast and super-sharp lines; photographic reproduction is second to none."
"In terms of Photographic reproduction the Mustek 1200 returned to the top of the tree, superbly capturing the colour and in particular the detail, of our test photograph." Mustek 1200

FamilyPC

"As far as output quality is concerned the Scanexpress excelled... the Scanexpress 1200P is a good choice...and a cost effective one as well." Quality 5/6 Value for money 5/6 Mustek 1200

SYMBOL OF EXCELLENCE WINNER

Scanexpress 600 ..... £45+VAT (£52.88)
Optical resolution: 300x600dpi, Interpolated resolution: 1200dpi, Colour depth: 30-bit

Scanexpress 600 (A3 version) ..... £159+VAT (£186.83)

Scanexpress 1200 ..... £70+VAT (£82.25)
Optical resolution: 600x1200dpi, Interpolated resolution: 9600dpi, Colour depth: 36-bit

Scanexpress 1200 (SCSI version) ..... £99+VAT (£116.33)

Hewlett Packard scanner
ScanJet 4100C ..... £129+VAT (£151.58)
ScanJet 5100C ..... £159+VAT (£186.83)

Mustek DIGITAL CAMERA

Picture this!

Superb colour pictures – straight into your PC (No fuss, no films, no developing costs, and no scanner required!)

- Capture vibrant colour images any time, any place for instant use with your PC or laptop
- Use it to build-up your family album, or create flyers, adverts, newsletters, reports, or for property guides or insurance claims
- Simple point and shoot operation – fixed focus lens and automatic exposure
- 1.8" colour LCD screen for viewfinding and picture review
- Up to 640x480 resolution with 24 bit colour
- Fixed focus lens – 250mm to infinity
- Built-in 2Mb flash memory
- Store up to 48 images in memory, then download to your PC with the serial cable supplied
- Internal slot supports CF card for extra memory
- Auto flash
- Preview the output image on the camera, a PC or your TV screen
- Complete with batteries, image editing software, TWAIN driver, carry pouch and Mains supply!
- USB (Universal Serial Bus connection) (Requires Windows98)

System requirements: 486 or higher processor, Windows 3.1 or higher, 3.5" floppy disk drive, hard disk drive with at least 15Mb available, 8Mb RAM or higher, 256 colour VGA display or higher, RS232 serial port

USB UNIVERSAL SERIAL BUS

Mustek VDC-300
£159 (£186.83) +VAT

PANASONIC CD RECORDABLE

Create your own CDs!

- Easily create data, audio and multimedia CDs on your PC.
- Send video postcards on CD that automitically play on any PC.
- Back up important files such as tax records, spreadsheets and financial data.

Panasonic CW7582 CD-Writer (4x write, 8x read) ..... £150+VAT (£176.25)
Adaptec CD Creator software ..... £15+VAT (£17.63)
Blank CD-R disk ..... £1.50+VAT (£1.76)
Blank CD-R disk (10 pack) ..... £13+VAT (£15.28)

VIDEO CARDS

canopus

The complete DV editing system **DVRex-M1** ..... £1899+VAT (£2231.33)
DVRex-M2 option board ..... £300+VAT (£352.50)

See the EveshamVale MovieStation on page 4 for full details

ATI
3D Charger 2Mb (PCI Bus) ..... £25+VAT (£29.38)
3D Charger 4Mb (PCI Bus) ..... £33+VAT (£38.78)
3D Charger 4Mb (AGP Bus) ..... £34+VAT (£39.95)
All-in-Wonder Pro 8Mb (AGP) ..... £109+VAT (£128.08)
Xpert 98 8Mb (AGP) ..... £49+VAT (£56.58)
ATI TV (TV tuner card) ..... £69+VAT (£81.08)

CREATIVE CREATIVE LABS
Voodoo 2 12Mb ..... £129+VAT (£151.58)

EveshamVale
4Mb 3DFX card ..... £49+VAT (£57.58)

KEYBOARDS, JOYSTICKS ETC

MITSUMI Mouse as used in EveshamVale Prestige PCs ..... £10+VAT (£11.75)
EveshamVale Windows 95 Keyboard ..... £10+VAT (£11.75)

KEY TRONIC 'Windows 95' Keyboard as used in EveshamVale Platinum PCs ..... £25+VAT (£29.38)
"one of the best weighted and most comfortable set of keys of any mainstream keyboard and with its well valued cross and full Win95 compatibility, it gets our top vote." PC Plus

CH PRODUCTS
Flightstick ..... £27+VAT (£31.73)
Flightstick Pro ..... £49+VAT (£57.58)
Virtual Pilot ..... £62+VAT (£72.85)
Virtual Pilot Pro ..... £65+VAT (£76.38)
Pro Pedals ..... £69+VAT (£81.08)

Suncom TECHNOLOGIES
F-15E Talon ..... £47+VAT (£55.23)
G Force ..... £35+VAT (£41.13)
SFS Throttle ..... £76+VAT (£89.30)
Flight Controller ..... £25+VAT (£29.38)

Microsoft
IntelliMouse ..... £29+VAT (£34.08)
Home Mouse with 'Intellipoint' software ..... £16+VAT (£18.80)
Natural Keyboard ..... £39+VAT (£45.83)

CD-ROM DRIVES & PACKS

Panasonic 32x CD-ROM

Bare drive £45+VAT (£52.88)
Includes cables
NB – Bare drive requires motherboard with secondary IDE connector

CR-508 24x SCSI CD-ROM drive ..... £65+VAT (£76.38)
LF-D101E DVD RAM drive (internal unit, SCSI interface) ..... £349+VAT (£410.08)
LM-DB26E 2.6Gb DVD RAM media ..... £15+VAT (£17.63)
LM-DA52E 5.2Gb DVD RAM media ..... £23+VAT (£27.03)

TEAC
CD-524EK 24x IDE CD-ROM drive ..... £69+VAT (£81.08)
CD-532EK 32x IDE CD-ROM drive ..... £89+VAT (£104.58)
CD-532S 32x SCSI CD-ROM drive ..... £99+VAT (£116.33)
CD-R55SK 4x12 SCSI CD-R kit ..... £334+VAT (£392.45)
CD-C68E 6 disk CD-ROM autochanger ..... £99+VAT (£116.33)

CD-ROM WRITERS

hp
SureStore CD-RW 7200 (external kit) ..... £320+VAT (£376.00)
SureStore CD-RW 8100 (internal kit) ..... £259+VAT (£304.33)
Adaptec Easy CD Creator software for above ..... £69+VAT (£81.08)

Blank CD-R disks: Single ..... £1.50+VAT (£1.76) 10 pack ..... £13+VAT (£15.28)

Panasonic PD DRIVE

Internal model ..... £199+VAT (£233.83)
External model ..... £269+VAT (£316.08)

650Mb rewritable optical disks
Single ..... £19+VAT (£22.33)

WINDOWS 98

Windows98 upgrade ..... £69+VAT (£81.08)
Windows98 Plus Pack ..... £29+VAT (£34.08)

SOUND CARDS

CREATIVE CREATIVE LABS
SoundBlaster Live ..... £119+VAT (£139.83)

SPEAKER SYSTEMS

TEAC Power-MAX 1000 £149 (£175.08) +VAT

"We've seen many speaker sets with the Dolby Pro Logic logo on them, but this is the first one that fulfils the criteria... The sound produced is pretty impressive... better than anything else available for the PC"

YAMAHA YST-MS25

- Yamaha Active Servo Technology
- Magnetically shielded
- Subwoofer
- Dual stereo inputs

£69 (£81.08) +VAT

ZY-FI COMPACT £12+VAT (£14.10)

- 16 Watts PMPO (4 Watts RMS)
- Active or Passive use (active use requires batteries or optional mains adaptor)
- Magnetically shielded
- Volume Control
- Bass Booster
- Treble Booster

ZY-FI 2 PRO £49+VAT (£57.58)

"These are the boys to add a bit of oomph to your PC." PC Answers "Recommended"
Rating 9/10. "Excellent value for money." PC Zone
Rating 9/10. "a lot of sound for the money" PC Plus
Rating 6/6. "sound quality on a different level from the other speakers" PC Guide "Best Buy" September 1996

- 120 Watts PMPO (36 Watts RMS)
- Magnetically Shielded
- 140 x 230 x 150mm
- Volume Control
- Bass control
- Treble control

PC Guide

EveshamVale
FREEPHONE DIRECT SALES 0800 496 0800
Web: http://www.evesham.com

BIRMINGHAM	CAMBRIDGE	MILTON KEYNES	LEEDS	DUBLIN
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Fax: 0121 683 6869	Fax: 01223 322 883	Fax: 01908 230 865	Fax: 0113 203 2001	Fax: 00 353 1 855 4440

FREEPHONE DIRECT SALES 0800 496 0800 Web: http://www.evesham.com

HEWLETT® PACKARD

PRINTING

HP OfficeJet 635

£375+VAT (£440.63)

All in one colour printer, plain paper fax, scanner and copier

PRINT ■ 600x600dpi black with REt ■ 600x300dpi colour with ColourSmart ■ Versatile media handling including envelopes
FAX ■ Plain paper and PC faxing ■ 100 speed dials ■ Approx 65 page memory ■ Confirmation and activity reports
SCAN ■ 300dpi optical (1200dpi interpolated) ■ 24-bit colour ■ 256 greyscale ■ OCR software included ■ TWAIN interface
COPY ■ 600x300dpi text ■ 300x300dpi graphics/photos ■ Sheet-fed design ■ Up to 99 copies from original

HP DeskJet 720C

£167+VAT (£196.23)

The colour business printer that does it all

■ HP's PhotoREt II and ColourSmart II give outstanding results every time ■ Up to 8ppm black, up to 4ppm colour ■ Supports Intel's MMX technology for faster colour printing ■ Designed for MS Windows 3.1x/95/NT4 ■ Amazingly quiet ■ 1000 page per month duty cycle

HP DeskJet 420	£75+VAT (£88.13)	HP 2000C	£469+VAT (£551.08)
HP DeskJet 340	£145+VAT (£170.38)	HP LaserJet 1100	£219+VAT (£257.33)
HP DeskJet 590C	£103+VAT (£121.03)	HP LaserJet 6 P	£489+VAT (£574.58)
HP DeskJet 710	£143+VAT (£168.03)	HP LaserJet 4000	£749+VAT (£880.08)
HP DeskJet 890	£213+VAT (£250.28)		

INK, TONER & OSM

Black ink cartridges		
51645A	DeskJet 720, 870, 890, OfficeJet Pro 1150, 1120	£19+VAT (£22.33)
51626A	DeskJet 400 series, 500 series, OfficeJet 350	£19+VAT (£22.33)
51629A	DeskJet 600 series, OfficeJet 635	£19+VAT (£22.33)
51633M	DeskJet 300 series	£18+VAT (£21.15)
51640A	DeskJet 1200, 1600C, 1600CM	£22+VAT (£25.85)
Colour ink cartridges		
C1823A	DeskJet 720, 890, 1120	£20+VAT (£23.50)
51625A	DeskJet 340, 400 series, 500 Colour series	£18+VAT (£21.15)
51641A	DeskJet 820, 870, 1100, OfficeJet Pro 1150	£24+VAT (£28.20)
51649A	DeskJet 600 series, OfficeJet 590, 635	£22+VAT (£25.85)
Special cartridges		
C1816A	Photo cartridge for DeskJet 690	£29+VAT (£34.08)
51640C	Cyan cartridge for DeskJet 1200, 1600C, 1600CM	£21+VAT (£24.68)
51640M	Magenta cartridge for DeskJet 1200, 1600C, 1600CM	£21+VAT (£24.68)
51640Y	Yellow cartridge for DeskJet 1200, 1600C, 1600CM	£21+VAT (£24.68)
Black laser toner		
C3906A	LaserJet 5L, 6L, 3100	£45+VAT (£52.88)
C3903A	LaserJet 6P, 6MP	£59+VAT (£69.33)
C4127A	LaserJet 4000, 4000T/N/TN	£69+VAT (£81.08)
C3909A	LaserJet 5SI	£119+VAT (£139.83)
C3105A	LaserJet 5, 5M Colour	£10+VAT (£11.75)
92296A	LaserJet 4, 4M, 5, 5N, 5M	£65+VAT (£76.38)
Colour laser toner		
C3102A	Cyan toner for LaserJet 5, 5M Colour	£10+VAT (£11.75)
C3103A	Magenta toner for LaserJet 5, 5M Colour	£10+VAT (£11.75)
C3104A	Yellow toner for LaserJet 5, 5M Colour	£10+VAT (£11.75)
3 year OSM		
H5461A	DeskJet 340, 400, 670, 690, 720, 1100	£40+VAT (£47.00)
H5465A	DeskJet 890, 1120, OfficeJet 590, ScanJet 5100	£59+VAT (£69.33)
H5467A	OfficeJet 635	£72+VAT (£84.60)
H5470A	OfficeJet 350, ScanJet 6100C	£109+VAT (£128.08)
H5471A	OfficeJet Pro 1150	£118+VAT (£138.65)
H5473A	DeskJet 1600C, 1600CM	£159+VAT (£186.83)
H5476A	LaserJet 6P, 6MP	£139+VAT (£163.33)
H5479A	LaserJet 5, 5M, 5N, 4000, 4000T/N/TN	£179+VAT (£210.33)
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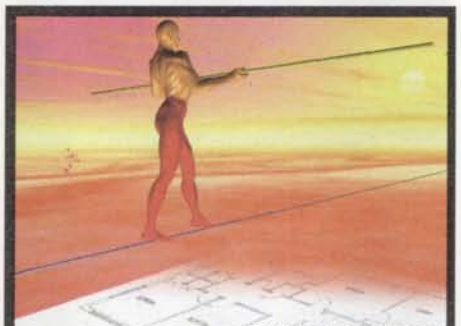

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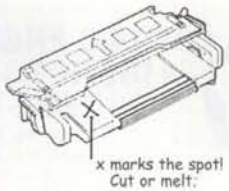

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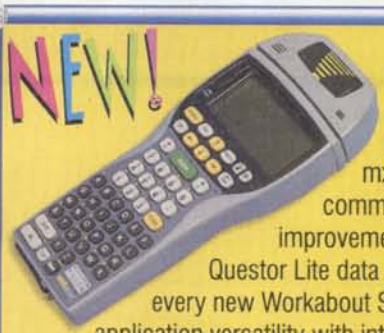

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ENTRY-LEVEL PC

Elonex
MLX-6333/1

Despite its rock-bottom price, the Elonex MLX-6333/1 does not skimp on any necessary components. With its 300MHz Celeron processor and large 6.4Gb hard drive, this system's performance is actually higher than many others which cost much more. And with a good graphics card (the Diamond Viper 330) and good on-board sound, this will more than meet your expectations of a budget machine.

➡ *PCW January '99, p152*

Price *£700* **Contact** *Elonex 0181 452 4444* **Also Recommended** *Roldec Puma* **Price** *£700* **Contact** *Roldec Systems 01902 456464 Linear Vantage XL* **Price** *£700* **Contact** *Linear Direct 0181 408 9888 (both PCW January '99)*

HIGH-END NOTEBOOK

IBM
ThinkPad 600

Built for the road warrior, this thin, light notebook excels in its build quality. Based around a variety of processors, ranging from a Pentium 233MMX and going right up to a Mobile PII 266, it also has a huge 4Gb hard drive, 32Mb RAM and a 13.3in TFT screen.

➡ *PCW July '98, p79*

Price *£4,266.43* **Contact** *IBM 0870 601 0136* **Also Recommended** *Gateway Solo 9100* **Price** *£3,876.33* **Contact** *Gateway 0800 282000 (PCW June 1998)*

MID-RANGE PC

Tiny
Family Bonus

With an easily upgradeable BX motherboard, the Tiny Family Bonus should keep you happy for a while. And it comes with no less than three useful peripherals: the Umax 610P scanner, the Epson Stylus Color 300 printer and the Fuji DX-5 digital camera.

➡ *PCW January '99, p148*

Price *£1,056* **Contact** *Tiny 0800 821333* **Also Recommended** *Dan Xplora II Plus* **Price** *£1,018* **Contact** *Dan 0181 830 1100 • Mertec XM300-K2* **Price** *£999* **Contact** *Mertec 01792 473700 (both PCW January '99)*

MID-RANGE NOTEBOOK

Sony
PCG-505G

Not only has the PCG-505G fabulous good looks, but it is also the ultimate in desirable equipment. It is incredibly small, thin and light for a fully fledged Windows 98 notebook, but also has everything you need to make working a pleasure. There is a floppy and docking station which connect to boost the functionality, and it even has 1394 built in as standard.

➡ *PCW December 98, p79*

Price *£2,300* **Contact** *Sony 0870 2402408* **Also Recommended** *Gateway Solo 2500 S6-300SE* **Price** *£2,173* **Contact** *Gateway 0800 172000 (PCW October '98)*

HIGH-END PC

Carrera
Power Pro 2-450

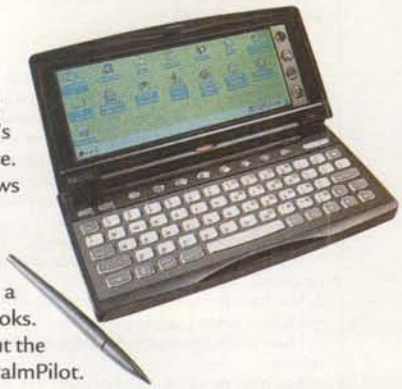
In addition to being a speed monster, the quality of this machine's internal components far outstrips others. The SoundBlaster Live! audio card is a perfect gamer's card with its four speaker, surround-sound output. Similarly, the fast 450MHz Pentium II processor is a good companion to the powerful Diamond Viper V550 graphics card.

➡ *PCW January '99, p141*

Price *£1,550* **Contact** *Carrera 0171 830 0486* **Also Recommended** *Armari NBX-350 9S* **Price** *£1,498* **Contact** *Armari 0181 810 7441 • Gateway G6-350* **Price** *£1,397* **Contact** *Gateway 0800 552000 (both PCW Jan '99)*

PDA

Hewlett-Packard
620LX



For cutting-edge technology in your pocket, Hewlett-Packard's 620LX has to be the only choice. It's based on the latest Windows CE2 operating system and is the first PDA we've seen with a colour screen. It's utterly gorgeous and, at £799, a serious threat to many notebooks. PDA fans should also check out the Psion Series 5 and the 3Com PalmPilot.

➡ *PCW May '98, p262*

Price *£799* **Contact** *HP 0990 474747* **Also Recommended** *Psion Series 5* **Price** *£429.9* **Contact** *Psion 0990 143050 • 3Com PalmPilot Pro* **Price** *£229* **Contact** *3Com 0800 225252 (both PCW May '98)*

Colour inkjet

Hewlett-Packard
DeskJet 890C

As all-round colour inkjet printers go, Hewlett-Packard's DeskJet 890C is hard to fault. Equally happy with photos or business graphics, it's our choice for the home or small office. Meanwhile, those on a budget should look no further than Canon's BJC-250, but those wanting the bigger picture will not be disappointed with HP's DeskJet 1120C A3.

➡ *PCW September '98, p186*

Price *£317.25* **Contact** *HP 0990 474747* **Also Recommended** *Canon BJC-250* **Price** *£116.33* **Contact** *Canon 0121 6808062* • *HP DeskJet 1120c* **Price** *£446.50* **Contact** *HP 0990 474747 (both PCW September '98)*

Colour photo printer

Epson
Stylus Photo 700

Colour inkjets have split into two categories, with this type clearly designed to reproduce the most realistic colour photographic prints. Epson has for a long time been the undisputed leader and its Stylus Photo 700 is our choice for inkjet photo printing. However, Lexmark comes very close behind with its 5700.

➡ *PCW September '98, p188*

Price *£273* **Contact** *Epson 01442 261144* **Also Recommended** *Lexmark 5700* **Price** *£229* **Contact** *Lexmark 01628 481500 (PCW September 1998)*

Budget laser printer

Panasonic
KX-P6300

A decent laser printer at under £200 excluding VAT? That's Panasonic's KX-P6300, which not only turns out great results in fast time but also boasts one of the smallest footprints of any printer. Its unusual vertical design, along with being a great-value all-rounder, made it our Editor's Choice in our entry-level laser group test.

➡ *PCW February '98, p194*

Price *£217.38* **Contact** *Panasonic 0500 404041* **Also Recommended** *Kyocera FS-600* **Price** *£280.83* **Contact** *Kyocera 01734 311500* • *Minolta PagePro 6* **Price** *£351.33* **Contact** *Minolta 01908 200400 (both PCW February '98)*

Business laser printer

Hewlett-Packard
LaserJet 4000TN

King of the laser printers, Hewlett-Packard has impressed us yet again with its latest office machine. Being 25 percent faster than the LaserJet 5, with 10,000-page toner cartridge, two 250-sheet input trays, network interfaces as standard and boasting superb output, the 4000TN should be the first choice as an office workhorse.

➡ *PCW February '98, p77*

Price *£1662.63* **Contact** *HP 0990 474747* **Also Recommended** *QMS DeskLaser 1400P* **Price** *£938.83* **Contact** *QMS 01784 442255 (PCW March '98)*

Multifunction device

Hewlett-Packard
LaserJet 3100

Good laser-print quality from this quiet machine. It's intelligent enough to detect a document dropped into its feeder and it will launch an idiot-proof menu for scanning, copying and emailing. Fast, accurate OCR and 2Mb memory for incoming faxes when the paper supply is exhausted, makes the 3100 an ideal multifunction device.

➡ *PCW June '98, p83*

Price *£629* **Contact** *HP 0990 474747* **Also Recommended** *Canon MultiPASS MPC20* **Price** *£370.13* **Contact** *Canon 0181 773 3173 (PCW January '98)*

Flatbed scanner

Umax
Astra 610P

Once again, the Umax Astra 610P parallel-port scanner has won our budget flatbed scanner group test, boasting an unbeatable combination of performance and value. Note that our three recommended scanners require enhanced parallel ports found only on modern PCs, so older systems, or users wanting top performance, should stick to SCSI.

➡ *PCW September '98, p229*

Price *£69.33 Contact Umax 01344 871329* **Also Recommended** *Agfa SnapScan 310P* **Price** *£116.50* **Contact** *Agfa 0181 231 4200* • *Microtek Phantom 330CX* **Price** *£75.95* **Contact** *Microtek 01908 317797 (PCW Sept '98)*

DIGITAL CAMERA

Kodak
DC260

Once again Kodak has produced the best digital camera for under £1,000. Not only does it have a high resolution, producing excellent images at 1536x1024 pixels, but it also has a 3X zoom. Add its advanced features, including scripting facilities and you have a highly desirable and indispensable camera.

PCW October '98, p226

Price £899 **Contact** Kodak 0800 281487 **Also Recommended** Epson PhotoPC 700 **Price** £587.50 **Contact** Epson 0800 289622 • Ricoh RDC-4300 **Price** £599 **Contact** Ricoh 01782 753355 (both PCW October '98)

MONITOR

Nokia
Multigraph 447Za

No matter what you do, it's vital to get a good monitor with a clean, flicker-free display. In April 1998's group test we looked at 17in models and found Nokia's Multigraph 447Za to be the best in our entry-level category. Those with more to spend should check out the Mitsubishi (*see panel, below*) which was our Editor's Choice in the high-end section.

PCW April '98, p204

Price £440.63 **Contact** Nokia 01793 512809 **Also Recommended** Mitsubishi DiamondPro 700 **Price** £569.88 **Contact** Mitsubishi 01707 276100 (PCW April '98)

MODEM

Diamond
SupraExpress 56e Pro

With ever-shifting goalposts, it makes sense to go for a modem which supports all the current standards, as well as simultaneous voice and data. Combine this with a roaring speed, superb ease of use and a low price, and you have the best-value modem around.

PCW December '98, p211

Price £75 **Contact** Diamond Multimedia 0118 944 4401 **Also Recommended** Zoom FaxModem 56Kx **Price** £89 **Contact** SCS Data Communications 01494 748904 (PCW December '98)

REMOVABLE STORAGE

Iomega
Jaz 2Gb

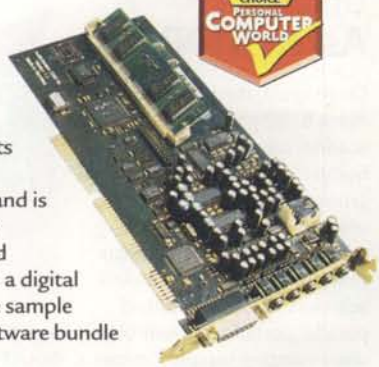
With such different capacities, interfaces and prices there is no one removable storage device to satisfy all needs. With the large capacity of 2Gb, the Jaz drive from Iomega should act as both an overflow for your hard disk and a back-up device to store all your vital data. If you are looking for something smaller, try either the Iomaga Zip, with a capacity of 100Mb or the 120Mb LS-120.

PCW August '98, p118

Price £270 **Contact** Iomega 0800 973194 **Also Recommended** Iomega Zip **Price** £70 **Contact** Iomega 0800 973194 • Imation SuperDisk 120 **Price** £105 **Contact** Imation 01344 402200 (both PCW August '98)

SOUND CARD

Terratec
EWS64 S



A cut-down version of the heavyweight EWS64XL, Terratec's S model still boasts much of the same sampling and processing capabilities and is also a great games card with accelerated DirectSound and positional 3D audio. There's a digital I/O option and upgradeable sample memory, and the decent software bundle includes Cubasis AV.

PCW July '98, p210

Price £149.23 **Contact** Terratec 01600 772111 **Also Recommended** Creative Labs AWE 64 Gold **Price** £129.25 **Contact** Creative Labs 01245 265265 (PCW July '98)

GRAPHICS CARD

Diamond
Viper V550

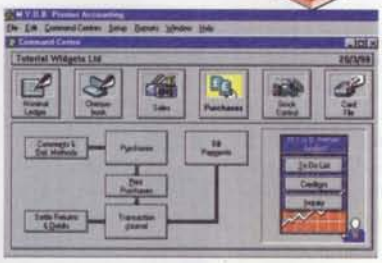
Sporting Riva's latest TNT chipset, the Viper V550 gives absolutely storming 3D performance, with a full 3D feature set and good image quality to boot. Its 16Mb of RAM gives ultra-high 2D desktop resolutions in standard Windows applications.

PCW November '98, p198

Price Approx £150 **Contact** Diamond Multimedia 0118 944 4400 **Also Recommended** MetaByte Wicked 3D **Price** £211.50 **Contact** Watford Electronics 01582 745555 (PCW November '98)

Accounting

Tas Books
MYOB



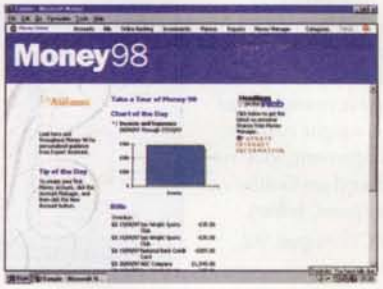
Ideal for the owner-manager and good for bookkeepers too, Mind Your Own Business (MYOB) is our choice for accountancy software. We also recommend TAS Books which offers good bookkeeping and very powerful analysis.

➡ *PCW June '98, p198*

Price *£229.13* **Contact** *Bestware 01752 201901*
Also Recommended *TAS Books* **Price** *£116.33* **Contact** *Megatech 01372 727274 (PCW June '98)*

Personal Finance

Microsoft
Money Financial Suite 98



Microsoft Money Financial Suite 98 is our choice for personal finance. It offers online banking and updating facilities, plus Sage compatibility, all at a bargain price.

➡ *PCW May '98, p196*

Price *£49.99* **Contact** *Microsoft 0345 002000*
Also Recommended *Quicken 98* **Price** *£39.99* **Contact** *Intuit 0181 990 5500 (PCW June '98)*

Database

Microsoft
Access 97

The industry-standard database application is also the best. With its wizards, infamous Office Assistants and standard Windows interface, Access 97 is relatively easy for the novice. And its powerful relational features and VBA integration make it suitable for developers, too.

➡ *PCW November '98, p220*

Price *£299* **Contact** *Microsoft 0345 002000*
Also Recommended *FileMaker Pro 4* **Price** *£169*
Contact *FileMaker 0845 603 9100 (PCW November '98)*

DTP

Serif
PagePlus 5

Inexpensive, easy to use and surprisingly well equipped, PagePlus 5 offers extremely capable desktop publishing. Those wanting the choice of professional publishers will have to fork out more for Quark XPress 4.0.

➡ *PCW June '98, p132*

Price *£99.95 Contact Serif 0800 376 7070*
Also Recommended *Quark XPress 4* **Price** *£1,169* **Contact** *Quark 01483 454397 (PCW June '98)*

Image Editing

Ulead
PhotoExpress 2.0

Ulead has succeeded in removing the frustration factor often involved in getting to grips with digital pictures. PhotoExpress 2.0 is a pleasure to use, with a great, clearly structured interface and fast, in-depth tools. It has pre-set editing modes for the novice and custom adjustments for each editing function, so the power user will be kept happy, too.

➡ *PCW January '99, p202*

Price *£34.95* **Contact** *BIT 01420 83811* **Also Recommended** *Adobe PhotoDeluxe 3* **Price** *£45.83* **Contact** *Adobe 0181 606 4001* • *Paint Shop Pro 5* **Price** *£69.95* **Contact** *Digital Workshop 01295 258335 (both PCW Jan '99)*

Drawing

Corel
CorelDraw 8

Not one of Corel's classic years, but this is still the Windows drawing package to own. Version 8 of the giant suite boasts better drawing and new interactive tools. Budget drawers should check out Micrografx Windows Draw 6.

➡ *PCW October '98, p203*

Price *£464.13* **Contact** *Corel 0800 581028* **Also Recommended** *Adobe Illustrator* **Price** *£351.32* **Contact** *Adobe 0181 606 4000* • *Freehand* **Price** *£327.82* **Contact** *Macromedia 01344 458600 (both PCW October '98)*

Information Managers

Starfish
Sidekick 98

The best personal information manager boasts wide customisability as its greatest strength. For heavyweight contact management, look no further than Goldmine 4 (*see panel, below*).

PCW August '98, p204

Price *£39.99* **Contact** *Starfish 0181 875 4455*
Also Recommended *Goldmine 4* **Price** *£229* **Contact** *AVG 0171 335 2222 (PCW August '98)*

Presentation Graphics

Lotus
Freelance 97

Our choice for electronic presentations. It may also come down to which office suite you own or are considering: as part of Microsoft Office 97, PowerPoint won't let you down.

PCW March '98, p200

Price *£49.35* **Contact** *Lotus 01784 445808*
Also Recommended *MS PowerPoint 97* **Price** *£325.47* **Contact** *Microsoft 0345 002000 (PCW March '98)*

Remote Access

Traveling Software
LapLink Tech

The high-end version of this extremely versatile product, LapLink Tech, has all the features of the standard version but also lets you print from the host machine on to a remote printer, or vice-versa, and talk to whoever is using the host machine. It includes anti-virus and hard-disk cloning utilities.

PCW December '98, p233

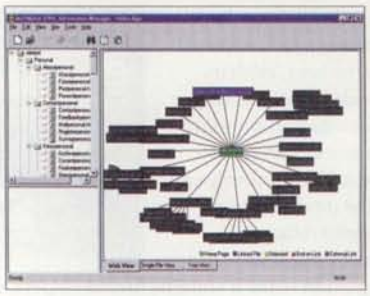
Price *£169.95* **Contact** *Traveling Software 01344 383232*
Also Recommended *Symantec pcAnywhere* **Price** *£75.08* **Contact** *Symantec 0171 616 5600 (PCW December '98)*

Web Design

SoftQuad
HotMetal Pro 4.0

An excellent all-rounder, HotMetal Pro 4 gets our thumbs up for web design. For a slick interface and Office 97 integration, Microsoft's FrontPage 98 is worth a look.

PCW January '98, p196



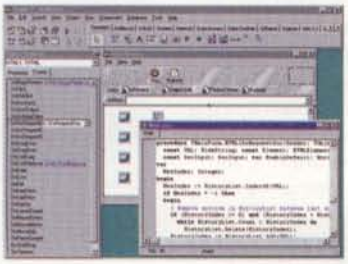
Price *£123.38* **Contact** *SoftQuad 0181 387 4110* **Also Recommended** *FrontPage 98* **Price** *£116.30* **Contact** *Microsoft 0345 002000 (PCW January '98)* • *Adobe PageMill 3.0* **Price** *£92.83* **Contact** *Adobe 0181 606 4001 (PCW May '98)*

Programming Tool

Symantec
Visual Café 2

Visual Café 2 is the most productive visual Java tool and has the option of native-code compilation for Windows. Windows developers should go for Borland Delphi 3 which, although more complex, comes into its own on larger applications.

PCW April '98, p177



Price *from £79* **Contact** *Symantec 0171 616 5600*
Also Recommended *Borland Delphi 3* **Price** *£95.18* **Contact** *Borland 01734 320022 (PCW April '98)*

Anti-Virus

Norton
AntiVirus 4.0

AntiVirus 4.0 is our choice for protecting your PC. It offers the best combination of features, ease of use and performance. Its virus detection rate is first class and there are free online updates for the life of the product.

PCW April '98, p124

Price *£49* **Contact** *Symantec 0171 616 5600*
Also Recommended *Dr Solomon's HomeGuard* **Price** *£29* **Contact** *Dr Solomon's 01296 318700 (PCW April '98)* • *F-Secure 4.0 AntiVirus* **Price** *£109.27* **Contact** *Portcullis 0181 868 0098 (PCW April '98)*

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PCs and Notebooks	Issue	Pages	Code
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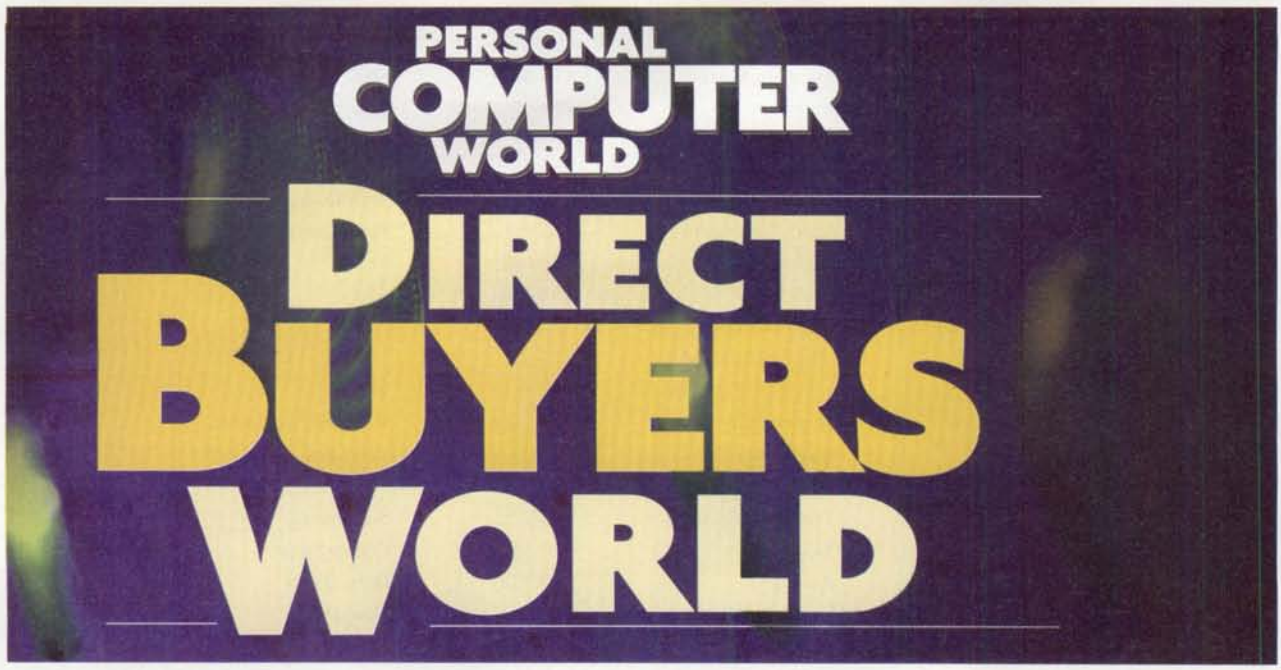

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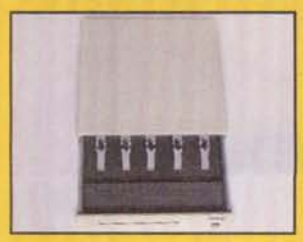

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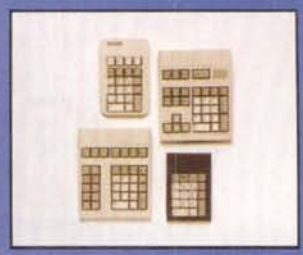

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No-one... nowhere... wants an email from you

I HATE EMAIL JOKES. In fact, hate is perhaps not a strong enough emotion to describe the feeling you get when you receive the same Clinton/Lewinsky joke *for the fourteenth time!* The intense fury and frustration you feel cannot be a good thing when you consider the original intention was, presumably, to make you laugh. Have you noticed, too, that the source of this so-called humour is very often the US? Don't get me wrong, I put Frasier and Larry Sanders at the top of my favourite TV comedies, but sadly their script writers don't seem to have anything to do with those hilarious lists which are emailed (27 times) concerning the differences between men and women, office politics and such like. I blame a lack of email etiquette. You know what I'm talking about: those thousands of office workers who've just been given access to the net without any training. I'm not saying the so-called technophiles are any better, always complaining about wasted bandwidth and using impenetrable acronyms, but at least they tend to leave the jokes alone.

Those who insist on mindlessly forwarding email humour may want to at least delete the often enormous headers that precede them. You know, the ones which contain megabytes-worth of addresses and the occasional throw-away remark about how this really reminded them of someone called Brad. In fact, rather than delete the headers, the jokesters have discovered...

▲ THIS MAN HAS JUST RECEIVED HIS 156TH MONICA LEWINSKY EMAIL JOKE — BE WARNED!

ATTACHMENTS. Why send a mere text joke when you could distribute the security-video'd bloke who punches his monitor (*pictured, above*) or the poorly Photoshop'd screen-grab of Carol Vorderman next to the Countdown vowels and consonants which — wait for it — now read as something slightly naughty? I received that one no less than 12 times, each accompanied by longer and longer headers which also included my name from when I had *originally* received it several months earlier.

There is one thing more annoying than a poor American joke, and that's the fake virus warning. You know, the one which threatens to "erase your hard disk, and all your colleagues' hard disks, and your mother's hard disk, too". Wow! Glad I got that warning before my entire business and family got wiped out.

Was I the only one who was told at school that chain letters were an evil thing? At least my company bears the financial brunt of downloading all this rubbish. Attachments are bound to be banned soon, though, which will really affect anyone trying to send genuine work. I guess our carefree buddies across the Atlantic don't see it as a problem, since they get free local calls and hence internet access at no charge. *No wonder they're laughing!*

IVOR BUGBEAR

Oops!

■ In *Letters, PCW* December [p64] the winner of the star prize was robbed of his fame when his name went walkies. Congratulations to B. Cooke, of Loughborough, who walks away with a 17in Taxan monitor.

■ Also in December [p41] we said that "by the end of 1997, 27 percent of all households in the United States had purchased airline tickets online". This should have read, "27 per cent of all US households that shop online, had purchased airline tickets online."

next month

BUDGET PCs GROUP TEST

If the Christmas and New Year celebrations have left money too tight to mention, why not check out our budget PCs group test? We've compared ten models, each for the amazing price of only £499.

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- Diamond Monster 3D II Card (12Mb 3Dfx Voodoo 2)
- Yamaha XG based 3D Wavetable Sound
- 56Kbps V90 modem
- 2 serial, 1 parallel, 1 games, 2 PS/2 ports
- 19" SuperVGA Colour Monitor
- Stereo speakers with subwoofer
- Keyboard
- Microsoft® Intellimouse
- Microsoft® SideWinder Joystick
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- Heavy Gear
- Need for Speed II Special Edition
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The Viglen HomePro Series

When it comes to choosing PCs, Viglen is well equipped to cater for all your needs. Within our award-winning HomePro range, you'll find a system that's just perfect for you – right up to latest state-of-the-art Intel® Pentium® II processor technology running at an amazing 450MHz, providing you with a multimedia experience that is second to none.

And as with all Viglen PCs, you know that your system comes with unrivalled technical support and after-sales service.

So whether it's an entry level family PC, an all-round home office workhorse or the very best in multimedia power, Viglen's got the best solution.

intel inside pentium® II processor

Viglen's Software Advantage

MICROSOFT HOME ESSENTIALS '98

Every single Viglen HomePro system comes shipped as standard with Microsoft's fully-rounded Home Essentials '98 software suite. A wide range of fully-featured applications worth hundreds of pounds, from the world's leading Word Processing software, through multimedia-rich education to entertainment titles and more, Home Essentials covers all your software requirements.

Microsoft® Word® '97 Latest release of the world-famous and market-leading power word processing package.

Microsoft® Works® 4.5 Five essential tools for easier everyday computing. Word processor, spreadsheet, database, graphics and communications tools.

Microsoft® Money '98 Complete set of financial management tools for managing your personal finances, budgets and investments.

Encarta World Atlas 3.0 Superb interactive and multimedia enhanced atlas, ideal for both reference and education.

Microsoft® Windows® Puzzle Collection Exciting puzzle and game compendium, providing hours of fun and intrigue.

INTERACTIVE GOLD PACK

What's more, all Viglen HomePro models are additionally supplied with the following incredible value bonus software pack, featuring the very best in multimedia encyclopaedias and two chart-topping entertainment titles:

Oxford Interactive Encyclopaedia Massive information resource from one of the world's most respected publishers. Featuring full multimedia content, including video and audio clips and high-res pictures, this acclaimed encyclopaedia is both easy to use, enjoyable and hugely educational.

Heart Of Darkness With state of the art 3D cartoon-like graphics, and a perfect mix of strategy and action, Heart Of Darkness sets a new standard in adventure games. Featuring ground-breaking fully rendered and textured 3D graphics.

Command & Conquer: Red Alert Manage an entire war for control of the world! Latest release in the series of award-winning real-time strategy games, C&C:Red Alert offers improved artificial intelligence when playing a computer opponent and live head-to-head play over the Internet.

3D PLATINUM PACK

If all this wasn't enough, to highlight the amazing graphics capability of the fitted Voodoo 2 3D Accelerator, all Viglen HomePro Awesome and Awesome Plus models are additionally supplied with 3 extra 3D rich award-winning games and 4 demos, as listed below:

Heavy Gear Full version. Take command of your own Battle Robot.

Need for Speed II Special Edition Full version. Exciting arcade-style high-speed racing game.

Tomb Raider II OEM version. Phenomenal million-selling arcade adventure.

Incoming, Battlezone & Flight Unlimited (playable demos).

Final Fantasy VII (non-interactive demo).

More Awes

Ⓐ HomePro Value

Just perfect as the family's first PC, the HomePro Value is a fully configured multimedia and internet ready system. With no compromise on specification, the HomePro Value offers an unequalled combination of performance and value for money.

- Desktop Case
- 32Mb RAM
- 3.2Gb Hard Drive
- 1.44Mb Floppy Drive
- 32X Speed CD ROM
- 2Mb AGP Graphics
- Wavetable Sound
- 56Kbps V90 modem
- 1 serial, 1 parallel, 1 games, 2 PS/2 ports
- 15" SuperVGA Colour Monitor with sidemount stereo speakers
- Keyboard
- Microsoft® Intellimouse
- Microsoft® Windows® 98
- Microsoft® Home Essentials
- Interactive Gold Software Pack

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from £649.00 exc. delivery & VAT from £791.95 inc. delivery & VAT

	Exc Del & VAT	Inc Del & VAT	Order Code	Easy2Own
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Intel® Celeron™ Processor 333MHz 128Kb cache	£699.00	£850.70	SYHV33M6	£27.16

INTERNET READY

© HomePro Awesome

Featuring the very latest in technology with 100MHz FSB (front side bus) combined with Intel® Pentium® II processor speeds of up to 450MHz, the HomePro Awesome is the most advanced multimedia system of its kind. ATI Xpert AGP 2x graphics with 8Mb of memory combine with renowned Voodoo 2 3D acceleration to deliver stunning video performance. Add in a 19" monitor, Yamaha XG based 3D wavetable sound, Yamaha stereo speakers (including subwoofer), and there is nothing more you could want from a multimedia system.

- Medium Tower Case
- 100MHz Front Side Bus
- 128Mb PC100 RAM
- 512Kb cache on CPU
- 10Gb Hard Drive
- 1.44Mb Floppy Drive
- 32X Speed CD ROM
- ATI Xpert 98 8Mb AGP 2x Graphics
- Diamond Monster 3D II Card (12Mb 3Dfx Voodoo 2)
- Yamaha XG based 3D Wavetable Sound
- 56Kbps V90 modem
- 2 serial, 1 parallel, 1 games, 2 PS/2 ports
- 19" SuperVGA Colour Monitor
- Yamaha stereo speakers with subwoofer
- Keyboard
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- Microsoft® Windows® 98
- Microsoft® Home Essentials
- Interactive Gold Software Pack
- 3D Platinum Software Pack

	Exc Del & VAT	Inc Del & VAT	Order Code	Easy2Own
Intel® Pentium® II Processor 350MHz	£1329.00	£1590.95	SYHA3526	£50.80
Intel® Pentium® II Processor 400MHz	£1429.00	£1708.45	SYHA4026	£54.55
Intel® Pentium® II Processor 450MHz	£1569.00	£1872.95	SYHA4526	£59.81

The very latest in Add-ons and Upgrades this Christmas

Why not upgrade your chosen system with any of the following options which have been carefully selected to offer great value and provide you with the latest and best technologies currently available. Please note, these items are only available as upgrades or add-ons to new systems and must be ordered at the same time as the main system.

MONITOR SCREEN SIZE UPGRADE

Monitor Viewing Area

15"=14" viewable

17"=15.3" viewable

19"=18" viewable.

MONITOR UPGRADE

Upgrade from 15" to 17" monitor

£60 exc VAT. (£70.50 inc VAT).

Upgrade from 15" to 19" monitor (no speakers)

£210 exc VAT. (£246.75 inc VAT).

Upgrade from 17" to 19" monitor (no speakers)

£150 exc VAT. (£176.25 inc VAT).

COLOUR INKJET PRINTERS

Enter the exciting world of digital art! The following printers offer the latest in colour printing by not only providing excellent print quality for normal use but also the ability to print photo quality images.

HP DESKJET 690C

Simple to set up and easy to use, the HP DeskJet 690C delivers sharp black text and superb colour. Just perfect for quality everyday printing. **£109 exc VAT (£128.08 inc VAT).**

HP DESKJET 895CXI

The brand new HP DeskJet 895CXI produces photo-quality colour printing at speeds of up to 10 pages per minute. **£209 exc VAT (£245.58 inc VAT).**

CANON BJC-250

The affordable colour Bubble Jet printer ideal for the whole family. **£89 exc VAT (£104.58 inc VAT).**

CANON BJC-4300

The ideal desktop companion at home or in the office, the BJC-4300 colour Bubble Jet printer comes with new Drop Modulation Technology™ for professional quality results. **£109 exc VAT (£128.08 inc VAT).**

ome Christmas Offers

Ⓑ HomePro Ultimate

With massively enhanced specification in almost every area, and featuring the very latest in Intel® Pentium® II processor technology, the HomePro Ultimate takes you to the next level of multimedia performance.

- Desktop Case
- 100MHz Front Side Bus
- 64Mb PC100 RAM
- 512Kb cache on CPU
- 6.4Gb Hard Drive
- 1.44Mb Floppy Drive
- 32X Speed CD ROM
- ATI Xpert 98 8Mb AGP 2x Graphics
- Yamaha XG based 3D Wavetable Sound
- 56Kbps V90 modem
- 2 serial, 1 parallel, 1 games, 2 PS/2 ports
- 17" SuperVGA Colour Monitor with internal stereo speakers
- Keyboard
- Microsoft® Intellimouse
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Intel® Pentium® II Processor	400MHz	£999.00	£1203.20	SYHU4026	£38.42
Intel® Pentium® II Processor	450MHz	£1139.00	£1367.70	SYHU4526	£43.67

INTERNET READY

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from £1329.00 exc. delivery & VAT from £1590.95 inc. delivery & VAT

INTERNET READY

Leading Software Titles Included

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CANON BJC-7000

The ultimate heavy duty colour Bubble Jet printer producing a print quality to equal that of normal photographs. **£199 exc VAT (£233.83 inc VAT).**

All printers include FREE printer cable and FREE delivery if ordered and shipped with a Viglen PC.

COLOUR FLATBED SCANNER

MicroTek Phantom 330 Scanner

Import colour pictures and text directly into your PC! Add this renowned flatbed A4 colour scanner to your system and simply scan in photographs or documents for use in other applications. **£65 exc VAT (£76.38 inc VAT).**

CD ROM TO 4X DVD UPGRADE

By specifying a DVD ROM instead of a CD ROM for your Viglen PC, you'll still be able to do everything you can with a CD ROM, plus read the new standard DVD CD's which are set to sweep the market. Viglen's 4X DVD Upgrade also comes with a software movie player, so you can watch all the latest DVD movies. Upgrade only available on Ultimate and Awesome models. **Upgrade from 32x CD ROM to 4X DVD ROM and software decoder £55 exc VAT (£64.63 inc VAT).**

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Every Viglen PC comes with lifetime technical support and a 12 months parts and labour warranty, including collection and return to you at our expense (mainland UK only).

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The Kyocera ECOSYS FS-800 may be small, but it's a hot little printer to have around. Its impressive features make it ideal for small workgroups who need more power without the associated bulk and cost.

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